The RUBBER AGE

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Published Twice-a-Month by

The PALMERTON PUBLISHING CO., Inc.

(Publication Office—1-3 Peace Street, New Brunswick, N. J.)

Editorial Office: 250 West 57th Street, New York City

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Late News of the Rubber Industry

Manufacturers Follow Tire Cut By Acquisition of Distributors

DETAILS of the tire price readjustment that took effect February 4 show that reductions of from 2½ to 5 per cent were made on balloon sizes for the standard 4.40- and 4.50-inch rims, which cover the new Ford and Chevrolet models, and cuts of from 2½ to 10 per cent on certain high pressure cord casings which are rapidly being displaced by balloons. On the other hand, six-ply tires were advanced in price approximately 2½ per cent. The B. F. Goodrich Company took the lead in the revised schedule, followed by the Goodyear Tire & Rubber Company.

Officials of the companies denied that the reduction has any bearing on the recently announced cuts by mail order houses. In the latter part of December, the catalog of Sears, Roebuck & Company and Montgomery Ward & Company carried downward revisions of from 7 to 20 per cent. It is said that of the total daily production of Goodyear's Akron plant, more than 10,000 tires, or more than 15 per cent of the entire output, are being made for Sears, Roebuck & Company at the present time.

Another activity on the part of tire manufacturers that has become especially marked since the price adjustments is the taking over of many of their dealer stores, either through outright purchase or by control on a 51-49 basis with the former owners employed as managers. According to some sources, this struggle for the large tire merchants is becoming more intense daily and is not having a good effect among the ranks of independent dealers, now faced with competition from their own manufacturers. Major tire manufacturers are expected by some authorities to acquire upward of 1,000 dealer establishments during the present year.

Goodyear Reports Net Profit Of $13,327,843 During 1928

FOLLOWING a meeting of its board of directors on February 11, the Goodyear Tire & Rubber Company issued to stockholders its annual report, revealing that net profits for the year of 1928 totaled $13,327,843, after charges, depreciation and interest. This is equivalent, after preferred dividend requirements, to $7.31 a share on the common stock outstanding at the close of the year, and compares with profits of $13,135,666 in 1927 and $8,799,138 in 1926.

A new record in sales was made with a turnover of $250,769,209, topping all previous estimates and all totals of past years. The amount of consolidated net sales in 1927 was $222,178,540 and in 1926, $230,161,356. The total unit sales of tires, the company's principal product, increased more than 32 per cent over 1927, an increase exceeding any accomplishment of the company in recent years.

The figure for net profits is arrived at after providing $9,473,998 for depreciation and after deducting profits of subsidiary companies applicable to stock not held by Goodyear. The net shown includes $2,500,000 appropriated from $6,250,000 of special reserves created out of profits in previous years in anticipation of abnormal fluctuations in raw material prices. This amount was appropriated in the first half of the year due to the drastic declines in the value of crude rubber.

In submitting the report to stockholders, P. W. Litchfield, president, announced that asset ratios were now up to the point where the company could begin to pay dividends on common stock. After making book adjustments during the year, consolidated net current assets as of December 31, 1928, amounted to $87,905,786 and consolidated net total assets to $101,009,013, as against $59,985,131 and $99,975,219, respectively, required by the provisions of the first preferred stock as a condition to the right of the company to pay dividends on common stock.

"At December 31, 1927, the consolidated surplus stood at $25,589,105," Mr. Litchfield said. "Of that amount, $15,314,275 was represented by $5,000,000 appreciation in value of properties prior to 1921, and $10,314,275 balance of valuation placed upon goodwill, patents and certain other assets when the company was reorganized as of March 1, 1921. Under Ohio law, that part of the surplus arising from such appreciation and valuation may not be regarded as available for the payment of cash dividends. Accordingly, and with a view to simplification and improvement of the 1928 balance sheet presentation and a clearer exposition to stockholders of the corporate financial situation, your directors have made several major book adjustments. The valuation of goodwill and patents has been written down from $10,209,275 to the nominal amount of $1 out of surplus arising from appreciation and valuation as above indicated."

This adjustment, together with surplus paid in on sales of common stock and earned surplus, results in an increase in the stated capital of the first preference stock to $100 a share, making its book value more nearly coincide with its redemption value.

Directors have approved issuance of additional common stock at $80 a share at the rate of three new shares for each ten shares of record February 21. This would increase the common stock outstanding by approximately 323,000 shares. Warrants for subscriptions are good until March 16. This capital increase will permit further investment in raw material supply, both crude rubber and tire fabric, and increase working capital to enable the company to care

for rapidly expanding business both domestic and foreign.

Consolidated income account for year 1928 compares as follows:

	1928	1927	1926
Net sales	$250,769,208	$222,178,540	$230,161,356
Ex. fed. tax., depr., etc.	†233,000,969	200,313,920	215,240,428
Balance	$17,768,239	$21,864,620	$14,920,928
Other income	1,799,147	1,225,001	1,517,962
Total income	$19,567,386	$23,089,621	$16,438,890
Int. and other charges	4,417,142	5,029,282	6,336,297
Pfd. divs. of subsid., etc.	1,822,401	1,424,673	1,303,455
Reserve for commit. and conting.		3,500,000	
Net profit	$13,327,843	$13,135,666	$8,799,138
Pref. dividends	5,596,071	5,645,379	*8,743,444
Surplus	$7,731,772	$7,490,287	$55,694
Profit and loss surplus	19,344,736	25,589,105	30,705,014

*Includes 4¾% on account of arrears on preferred stock.
†After charging $2,500,000 cost of rubber to reserves.

Firestone Says Rubber Advance Is Due to Speculation Alone

SALE of crude rubber at prices above the 20-cent mark is due only to speculation, in the opinion of Harvey S. Firestone, president of the Firestone Tire & Rubber Company. Interviewed at Miami Beach, Fla., recently, he defined 20 cents a pound as a "fair price" and praised the work of the American Rubber Pool.

"Rubber has advanced from 17 and 18 cents a pound," said Mr. Firestone, "to 20 cents, which is a fair price, and the growers believe they should get 25 cents. I believe that American manufacturers have a good supply on hand to meet all demands and that, if the price does advance, it will be due to speculation and nothing else.

"Stabilization of the market is entirely due to the foresight of the manufacturers who formed the syndicate which has established the supply centre in the United States rather than in London. This syndicate is the one thing that has enabled us to keep the situation well in hand. Of course, we were unable to do much last year, with the elimination of restriction, but we are in good shape now."

Keller Now President of Mason Tire & Rubber Co.

THE bondholders of the Mason Tire and Rubber Company, who have taken over all of the properties of the company, have completed their reorganization under the firm name of the Mason Tire and Rubber Corporation. It is stated that Mason tires will be ready for the market on or before March 1, and that the Kent plant will be put in operation at once.

H. G. KELLER

The company will concentrate its efforts on one line of high quality tires only, and will sell its products on an exclusive distributor basis. A new policy has been established by the new organization, and will be followed to the letter. "The vascillating policy of the old Mason company is a thing of the past," says an official statement from the new executives.

Henry Garrison Keller, who is president of the new company, is firmly convinced that a ready market exists for a quality tire. He has, therefore, surrounded himself with a staff, the personnel of which have had long experience in the manufacture of high grade tires.

Mr. Keller is a Pennsylvania graduate. He has had considerable experience in the management of manufacturing plants, and the study of market conditions. One of the first plants in England to manufacture roller bearings was designed, equipped and managed by Mr. Keller. In recent years he has been associated with Ford, Bacon & Davis, of New York City, and Ralph E. Davis, of Pittsburgh, in the valuation of public utility and industrial plants; also, in the study of markets and market conditions for proposed utilities.

The new company will have its first meeting of distributors March 1, at which time the sales policy will be discussed.

Mohawk Rubber Company Has Profit of $766,040

ANNUAL reports of the Mohawk Rubber Company of Ohio and the Mohawk Rubber Company of New York, Inc., show net profits for the year ending December 31, 1928, as $766,040.35 as compared with net profit for the year 1927 of $631,171.70. Declines in raw material prices and reductions in selling prices were responsible for heavy write-offs during the first half of the year, bringing the profit for that period down to approximately $290,000, as against $476,000 for the last six months.

Net sales for the year of $6,590,646.81 showed a material gain over those of 1927, both in units and in dollars. During the year the company sold $800,000 worth of notes, and in the month of September paid off its entire indebtedness to banks on open line of credit. At the present time, the company's balance sheet shows a healthy condition, having total assets of $2,364,000 to pay current liabilities of $412,000, including $100,000 worth of notes which mature within 12 months. This shows a current ratio of 5.7 to 1.

Commenting on this feature, S. S. Miller, president of the company, remarks in his statement to stockholders, that in the current statement there are no contingent liabilities and no indebtedness to bankers. He also comments on the fact that in anticipation of the retirement of these notes, $50,000 has been retired before maturity. The total accumulated past due dividends on the preferred stock were paid and current dividends on the preferred stock are being regularly paid in cash, while the company during the past year also declared a 300 per cent common stock dividend.

"We feel confident," says Mr. Miller, "that the steady increase in unit sales which we have enjoyed in the past year may be maintained during 1929, and we look forward to 1929 being a banner year for the company. The earnings continuing at a rate comparable with, or in excess of the earnings of last year should make it possible for the directors to resume in the near future the cash dividends on the common stock."

Falls Rubber Company to Have Additional Financing

OFFICIALS of the Falls Rubber Company, Cuyahoga Falls, O., predicted a brighter future for the organization, following a directors' meeting February 2, at which new officers were elected and a program of new financing approved. New equipment will be added to the company's factory, and an eight-ply "super" balloon tire called the Roadmaster will be put in production and marketed intensively.

G. D. Kratz, president for little more than a year, has been succeeded by Richard P. Bremer of Youngstown, O.,

a recognized expert in merchandising with more than 15 years of experience in the marketing of tires. Mr. Kratz, who succeeded J. O. King, becomes chairman of the board, a newly-created position, while Mr. King has resigned as a director although remaining a stockholder in the company.

The election resulted in the addition of George E. Bailey, an Akron attorney, and George C. Holgate, credit manager of the company, to the board of directors. W. P. Cline was re-elected vice-president and treasurer, and Mr. Holgate was named as secretary.

New financing in the form of a $200,000 three-year note issue at 7 per cent was decided upon in order to provide more working capital for expanding business. A financial report for the fiscal year ended November 30, 1928, showed a loss of $95,000 and sales of $2,758,000, the loss being taken after writing down heavy depreciation in crude rubber and other stocks. The report shows current quick assets amounting to $641,707.14, including $288,287.85 in cash, receivables of $166,052.19 and inventory of $187,367.10. Notes and accounts payable totaled $256,864.98—less than the actual cash assets.

The company reports orders sufficient to keep the plant running from 30 to 60 days, and it is expected that the factory will shortly get into its maximum production of 1,500 tires and 6,000 tubes daily. The new tire, which was introduced only this year, has a combination black and white sidewall and is said to be an innovation in design.

Holding Company Formed to Take Over Thermoid Rubber

THE Thermoid Company has just been incorporated under the laws of Delaware to take over the Thermoid Rubber Company and the Stokes Asbestos Company, of Trenton, N. J., which have been sold to a syndicate of New York bankers. Robert J. Stokes, president of the Thermoid Company and treasurer of the Asbestos Company, who made the announcement, declined to reveal the identity of the purchasers or the price involved. An offering was recently sold of an issue of $2,500,000 Thermoid Company five-year 6 per cent fund notes with stock purchase warrants and $1,000,000 7 per cent cumulative convertible preferred stock, together with 10,000 shares of common stock.

Outstanding capital stock of the two companies has changed hands and a holding company is now being formed to be known as the Thermoid Company. Officers of the Thermoid Rubber Company and the Stokes Asbestos Company will be included in the holding company, and the present management of the two companies will remain the same. Robert J. Stokes will become president of the new company, succeeding his father, William J. B. Stokes. The officers of the Thermoid Rubber Company will remain as follows: President, Robert J. Stokes; secretary-treasurer, Joseph O. Baur. Mr. Stokes will act as general manager of both companies, while Mr. Baur will be assistant general manager, and also treasurer of the asbestos company. Both plants, which employ 800 hands, will continue in operation. The plants cover nearly sixteen acres of land and have 256,000 square feet of floor space.

The Thermoid Rubber Company was incorporated in 1897 under the name of the Trenton Rubber Manufacturing Company. In 1909 the name was changed to the Thermoid Rubber Company. The Stokes Asbestos Company was chartered in 1920 as a separate concern.

The Thermoid is one of the largest companies making brake lining in the United States and is the largest of all American concerns manufacturing hydraulic compressed brake lining. It maintains agencies in all parts of the world. In addition to brake linings, it makes clutch facings, mechanical rubber goods, moulded specialties, universal joint discs and auto radiator hose.

Canadian Seiberling Company Plans Program of Expansion

RECENT large orders placed by the Seiberling Rubber Company of Canada, Ltd., for additional equipment and new machinery are said to be the forerunners of an expansion program that is destined to make this company one of the foremost manufacturers in the Dominion. "The necessity of increasing our manufacturing facilities is brought about by the remarkable sales increase that Seiberling tires have enjoyed since our establishment in Canada in May, 1927," says C. A. Jones, vice-president and general manager, in a recent statement.

C. A. JONES

"In a period of less than two years, Seiberling sales have climbed from nothing to well over two million per annum. Since that time more than 1,200 dealers have been established with exclusive Seiberling franchises in 1,200 cities and towns in every province of the Dominion. Seiberling's export business has been equally encouraging both in tires and druggists rubber sundries. Trade connections have already been established in 23 different countries and the volume is showing a most satisfactory increase.

"Production schedules for almost every month of 1928 exceeded the schedules of the preceding month and January of this year reaches the record peak production of the organization's history."

Rubber Association Standardizes Mechanical Goods for Railroads

THE Rubber Association of America has just issued a booklet entitled American Railway Association Specifications for Mechanical Rubber Goods, which sets forth "standard" and "recommended practice" specifications for various types of rubber hose commonly used by railroads, including "General Instructions on Standard Methods of Tests for Mechanical Rubber Goods."

Prior to 1923 every railroad had separate and distinct specifications for the various types of hose which it bought. At that time, in order to avoid the waste and confusion resulting from this condition, the Committee on Specifications and Tests for Materials of the Mechanical Division of the American Railway Association, and the Specification Committee of the Mechanical Rubber Goods Division of the Rubber Association joined in formulating A. R. A. "standard" and "recommended practice" specifications. For the last five years the mechanical goods division of the Rubber Association has made continuous efforts to bring about the adoption of these A. R. A. specifications, as they have been revised from time to time, by individual railroads customarily buying rubber goods according to detail specifications of construction and quality.

Today it is conservatively estimated that 90 per cent of the railroad hose bought under detail specifications is purchased according to these specifications with resultant benefits to the railroads through improved products, and to the manufacturer through economy in production and reduced inventories.

Copies of the booklet are available to those interested, upon application to the Rubber Association of America.

Converse Rubber Company Reorganization Completed

FOLLOWING the sale of the assets of the Converse Rubber Shoe Company by M. L. Paterson, receiver, to the Converse Holding Company on January 9 for $1,292,833, the Converse Rubber Company, a new Massachusetts corporation, has taken over the assets and is conducting the business along the same lines as its predecessor. Premium quality rubber footwear under the trademark "Converse Big C line," sold direct to the retailer is being manufactured, and a new second quality line under the trademark "Liberty" brand is also being manufactured.

Officers of the new company are M. B. Kaufman, president; M. L. Paterson, vice-president; F. R. Allen, treasurer; and A. H. Wechsler, clerk.

The operating organization includes M. L. Paterson, general sales manager; F. R. Allen, comptroller; L. D. Ackerman, technical manager; E. F. Casey, factory manager; R. C. Kelley, production manager and general purchasing agent; and L. P. Sanborn, cost accountant. All of these men have been connected with the Converse organization for a number of years.

Rutherford Finds Tire Values Save Public Billion Dollars

WITH the public eye focused on motor car value, dramatic facts relating to tire values have been overlooked, in the opinion of W. O. Rutherford, president of the Pennsylvania Rubber Company, Jeannette, Pa. The public is receiving greater value for its money than ever before, he declared in a recent statement.

"I don't believe the motoring public is conscious of the truly amazing value it is receiving today from the rubber industry," Mr. Rutherford says. "Available figures show the manufacturers of this country in 1928 produced approximately 78,500,000 tires with a wholesale value of about $670,000,000.

"Neither wholesale nor retail prices represent the true value of these tires. For actually the public paid, and is paying, 30 cents for a dollar value. Therefore, were the motorist to pay in a basis of actual worth, the nation's tire bill last year would have exceeded $1,800,000,000.

"This tremendous enlargement of value is due to several causes. One is the low price of crude rubber. Another is a more highly developed and more economical method of manufacture. A third is the keen competition.

"All of the ingenuity of this industry is concentrated on one thing: finer and better tires. Natural pride and the spirit of service dictate it. The newest development, 6-ply and super tires, is a concrete expression of this devotion to progress. These tires give two and three times the tire mileage of present day standard tires and much more comfort. They signalize the farthest development to date—yet they cost just about half what a standard tire of a few years back cost.

"Rubber values, as we see them today, are not only the inevitable result of scientific evolution but of a systematic and unswerving determination, altruistic in character, to give transportation the finest that can be produced."

Courtesy of The New York World.

O'Neil Predicts Akron Will Be Even Greater as Rubber Centre

THAT Akron firms are the only companies in the rubber industry making money and that for that reason Akron will continue to expand as the world's rubber capital is the belief of William F. O'Neil, president of the General Tire & Rubber Company. His opinion, expressed in a recent statement, is that the rise of other sections as so-called "rubber centres" is unimportant.

"This city," he declared, referring to Akron, "ten years from now will be an even greater rubber centre than it is today. More factories, millions more capital and vastly greater activities, stretching around the world will be centred here for another decade. The industry here is growing bigger and stronger. The number of tire factories doing business in the Akron district today is the same as in 1920 and most of these have grown. One or two minor companies have started and one or two have quit in this period.

"Against this Akron showing, however, we have the report of the industry as a whole which shows that of about 300 companies scattered over the country in 1920, only about 90 of those are in business today. Just 210 large and small plants have died.

"Some of these might have survived in Akron where they could have had our advantages and obtained good men to build better tires. This mortality rate of rubber companies outside of Akron is sufficient proof in itself to establish the city's ability to remain the rubber centre of the world. Akron has a corner on the rubber brains of the country.

"We have a wonderful supply of labor and when increased production requires more tire builders we can fill our ranks with an army of trained tire men the same day. Such a supply of labor makes it possible for Akron to turn out the quality tires of the world. Outside of Akron, men have to be recruited from other industries and go through a long training period before their work is sufficient or satisfactory."

The annual meeting of the Rubber Manufacturers' Association of New Jersey was held in December at the Trenton Club, Trenton, N. J. The following officers were elected: President, A. Boyd Cornell, of the Hamilton Rubber Manufacturing Company; vice-president, I. Ely Reed, of the Mercer Rubber Company; secretary, Charles E. Stokes, Jr., of the Home Rubber Company; treasurer, Horace B. Tobin, of the Woven Steel Hose & Rubber Company.

Tire Manufacture and Trade Throughout the World

At the Present Time About Twenty Countries Manufacture Automobile Tires—But Few Produce Sufficient for Their Own Requirements—Eight Countries Dominate the Export Field and Competition Is Keen

By HARRY W. NEWMAN

Business Specialist in Rubber
Bureau of Foreign and Domestic Commerce

APPROXIMATELY twenty countries manufacture automobile tires to serve the 31,725,000 automobiles now in circulation throughout the world, with the United States as the leading manufacturer as well as exporter. The rivalry in the world tire trade is keen, being strengthened each year by the eight principal exporting countries, while six additional countries are desirous of gaining a foothold in foreign markets for their surplus with the result that they are making material progress each year.

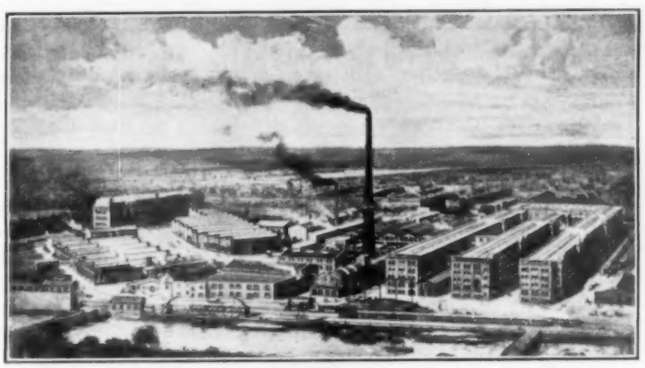
The tire manufacturing world may be divided into five principal groups: the countries which are the leading producers and exporters; the lesser producers and exporters; the minor manufacturing countries; the countries in which tire manufacturing is now defunct; and the countries which, in the near future, may become producers.

Outside of these groups appears Australia, which has reached self-sufficiency during the past couple of years, but as yet has not entered into export trade. With United States and English capital already present and with excellent skill at hand in the tire industry, Australia, in the course of a few years, may become a significant exporter to nearby Pacific markets.

In the first group are the United States, France, Canada, the United Kingdom, Italy, Belgium, Japan, and Germany, all of which are large manufacturers of automobile tires and compete in the international trade.

About 100 establishments in the United States manufacture rubber tires of all descriptions, but not more than fifteen enter seriously into export trade. During 1928 the United States exported 2,692,900 automobile casings, a margin of approximately 965,000 over its nearest competitor, France.

Dunlop Rubber Company's Main Plant at Fort Dunlop, England



Plant of the Harburger Gummiwarenfabrik Phoenix A. G., at Harburg-Elbe, Germany

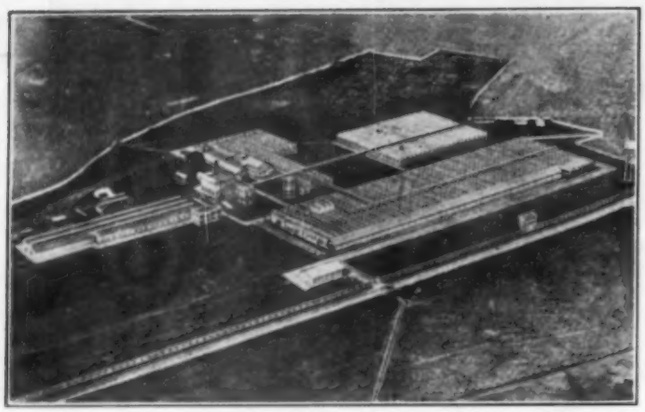
The French export trade is particularly centered in the Michelin company, although Bergougnan, French Goodrich, and French Dunlop enter the foreign field to a minor extent.

The Canadian industry is comprised chiefly of subsidiaries of well-known United States factories, which at present occupy third place in international trade. During 1928 Canada exported 1,674,550 automobile casings, slightly less than the estimated 1,728,000 exported by France.

The McKenna import duties enacted in Great Britain on April 1, 1927, placed greater demands upon the domestic industry in the British Isles so that the local tire factories were compelled to curtail their export activities. But with the establishment and subsequent operation of foreign subsidiaries within the Kingdom, namely, Goodyear, Michelin, Pirelli, Firestone, and India, the various British concerns engaged in tire exporting are now able to regain their loss in foreign markets and more intensified competition is anticipated from these sources. Dunlop is strengthening its efforts in foreign markets in which the company suffered a temporary decline during 1927 and 1928, and Goodyear is now exporting its English-made tires to nearby points, thus avoiding the longer hauls from the American plants.

The Englebert factory of Belgium has been increasing its activities lately and now exports more automobile tires than Germany, which, prior to the World War, maintained an important export trade. Italian exports are centered in the Pirelli factories, although foreign shipments are at times made from the Michelin subsidiary factory at Turin. The Japanese subsidiary of the British Dunlop company is practically responsible for the export trade of that Empire.

In the second group, which comprises the lesser producers and exporters, are Austria, Czechoslovakia,



New Michelin Works at Stoke-on-Trent, England

Hungary, Denmark, Sweden, and Soviet Russia. These countries have a considerable domestic production and consumption, and although they enter into foreign trade to a reasonable extent, they at present are not regarded as serious competitors in world trade.

The principal tire manufacturer in Austria is the Semperit Oesterrische Amerikanische Gummiwerke A. G., which produces tires under the trade name of "Semperit." Before the World War, and to a certain extent at present, the rubber industry was one of the most important enterprises of Austria proper. The country now supplies about 70 per cent of the local requirements. A minor export trade exists, principally to the secession States of Czechoslovakia and Hungary.

Rubber tires are produced in Czechoslovakia principally by the Matador Rubber and Balata Works, of Bratislava. This company employs approximately 500 workmen and besides automobile tires it produces a complete line of rubber and balata belting. This company formerly produced tires under the trade name "Cordial," but during the latter part of 1927 improved its productive facilities and changed the trade name to "Matador." It is understood that other rubber factories in the Republic, to a certain degree, are producers of rubber tires.

Hungary Produces Half of Local Demand

Automobile tires in Hungary are produced by the Hungarian Rubber Goods Factory under the trade name of "Cordatic." It is generally estimated in the trade, that Cordatic furnishes annually from 40 to 45 per cent of the total number of tires consumed in Hungary, although the company claims that it supplies 60 per cent of the tires consumed.

The Schinning & Arve, of Copenhagen, the only rubber factory in Denmark, produces automobile tires, but specializes more in the manufacture of technical rubber goods. The company reported a favorable year during 1927 with a profit of 420,000 crowns ($112,266) against a rather large deficit during 1926. During the Danish contract year 1927 (October to October) the local factory supplied consumers with approximately 5,000 tires, a slight increase over the previous year. It is estimated that Schinning & Arve supplies 3 per cent of the total domestic requirements.

The future tire production of Sweden is looked upon with interest by those concerned in the foreign production of tires. Two local factories manufacture automobile casings and inner tubes, but only one, Trelleborgs Gummiaktiebolag, offers any strong competition for foreign producers of tires. This company has sales agents throughout the country and its products are reported to be of a high quality and are gaining in popularity.

Furthermore, early in 1928 the rubber factories at Varnamo, which have been idle for a number of years, were purchased by a corporation for the production of rubber tires. The capital stock is controlled by Carl Gislow, of Gislaved, the founder of the rubber industry in Sweden, and Mauritz Berlin, of Stockholm. At present the competition from Gislaved is still considered to be of some importance, owing to the price policy pursued by the Cooperative Union, of which it is affiliated. It is not believed that this competition has grown stronger, but there is always the potential danger that it may do so.

Before the World War automobile tires were not only produced in the Russian Empire, but were exported to all the important foreign markets. Under the Soviet regime tires are produced by the Russian Rubber Trust and are now being exported to European and Near Eastern countries. The trust has succeeded in bringing about a regulation whereas all automobiles should be imported into Russia without rubber tires. For the fiscal year 1927-28 orders for tires have been received calling for 521,000 units.

In the third group, comprising the minor manufacturing countries, are the Netherlands, Spain, British Malaya, French Indo-China, and Mexico. The domestic manufacture in these countries plays only a minor part in the total consumption, but the effort to stimulate local production is apparent and may or may not result in the local plants becoming more important factors in the domestic consumption in the future.

The Netherlands has an annual production of bicycle tires which exceeds 2,000,000 pieces with an exportation of about 746,000, but as yet the manufacture of automobile tires has been negligible.

The only important Spanish manufacturer of automobile casings and tubes is Commercial Pirelli, a subsidiary of the Italian concern. It produces a very good tube that

Tan Kah Kee & Company Plant at Singapore

appears to be gaining in popularity by reason of its comparatively low price. The automobile casings so far have not offered any important competition.

The Chinese firm of Tan Kah Kee & Co., at Singapore, British Malaya, has for some time been producing automobile tires which were used chiefly on the numerous automobiles maintained by the concern. Recently, however, production has been strengthened with the ultimate intentions of placing it on a commercial scale. At present tires are offered at extremely low prices approximately two-thirds of those quoted by the American distributors, with a 10-month guarantee. Automobile owners in Singapore are being circularized through the mail with pamphlets of the company and in the up-country the local dealers are guaranteeing 8,000 miles.

At Saigon, French Indo-China, the Compagnie du Caoutchouc, which manufactures various rubber sundries,

(*Concluded on page 557*)

Temperature Control in Vulcanizers*

Various Practices of Temperature Control Beyond the Scope of Automatic Controls Are Reviewed—Many Unusual Vulcanizer Conditions Exist Making Special Applications Necessary

By C. B. MITCHELLA
Republic Rubber Company

IT is the assigned purpose of this paper to review various practices of temperature control in vulcanizers beyond the scope of automatic controls, the usefulness of which may be confined to the supplying and disposing of a heating medium in sufficient quantity to maintain a specified temperature in the vulcanizer within predetermined maximum and minimum limits.

In days gone by rubber goods of high quality were produced in vulcanizers which had no control except that exercised by the operator's occasionally opening and closing a few valves to admit and dispose of steam. The characteristics of the product were consequently very much dependent upon the skill of the vulcanizer man. Such vulcanizing required the operator's entire attention and the waste of steam was tremendous.

But notwithstanding the efficient operation of present-day automatic control devices, they can not assure perfect vulcanization without proper provisions on and within the vulcanizer itself. For the reason that steam vulcanizers have prevailed, no other type will be discussed in this paper.

The Advantages of Automatic Control

At the beginning it seems well to digress from the subject long enough to review the advantages of automatic control. The use of automatic control is advisable because:

1. It assists in getting uniformity of product by having like temperature for each cure of like specification.
2. It makes economy in steam consumption.
3. The use of accelerators of vulcanization, reducing length of time of cures, makes accuracy of specified temperatures more important than ever.
4. It assists in maintaining uniform temperature throughout the entire vulcanizer.
5. The temperature required for any cure can at will be altered definitely and easily.
6. When combined with a timing device, it permits use of any temperature rise such as required in step curing.
7. It reduces labor, supervision, and consequent human errors.
8. It may be made to give the proper sequence of numerous operations during time of vulcanization, and so regulate each operation that wasted time is minimized.

The success of vulcanization, whether the vulcanizer be of the open steam type, hot plate, or steam-jacketed mold, depends upon maintaining the proper temperature of the medium which contacts directly with the rubber product. Therefore, various means are employed in an attempt to maintain equal temperature throughout the entire vulcanizer and avoid any excessively hot or cold spots.

Starting where automatic control primarily leaves off, we have the steam inlet requirements, which are particularly important in open steam vessels. Steam entering should be diffused over a large area, usually entering through a perforated pipe of sufficient length so as not to strike the product with force. Oftentimes a baffle is set inside the vessel in front of steam inlet opening to deflect steam away from the product and avoid a premature overheating of product at that point.

Open Steam Vulcanizers

At the time of entering the rubber industry, the writer observed that in horizontal open steam vulcanizers, steam was usually admitted through two horizontal perforated pipes lying near bottom of vessel alongside the car track rails, the perforations pointing upward and somewhat outward, compelling the steam to travel parallel with sides of vessel to the top and center, then downward through the loaded car to the bottom.

It might be a fair question to ask—why do most of the present horizontal heaters have the steam inlet at the top where the temperature is naturally inclined to be greatest?

Another scheme now existing is to admit steam in the usual manner at the top of vessel and also admit through a smaller inlet similarly constructed at the bottom, the advantage claimed being to create a better circulation of steam during the filling-up period as well as during the entire cure.

With the admission of steam existing air in the vessel will be pocketed in various localities unless means of escape is provided. It has been customary to open partially the main exhaust valve, or to open a number of pet-cocks situated at appropriate points, and many operators insist upon the costly practice of keeping these pet-cocks open slightly throughout the cure to induce circulation and assure complete air removal.

In these open vessels it is very difficult to dispose of all air and there is a tendency for it to concentrate in large volume in some part of the heater. If the rubber product being cured lies within such an air pocket proper vulcanization will not be accomplished. Various means can be provided to break up these air pockets, one of the successful contrivances being an ejector placed so as to circulate steam constantly through the inlet and outlet openings.

To obtain equal temperature throughout any type of vulcanizer, perfect circulation must be abetted by complete drainage. The floor of the steam chamber must slope sufficiently toward the drainage outlet, and must have no de-

*Paper read before the third meeting of the Akron Group, Rubber Division, A. C. S., December 3, 1928.

pressions or dams to pocket the condensate and cause cold spots. The drainage outlet openings should be at the very lowest point of the chamber, and care should be exercised not to screw drain pipe fittings into the chamber so far that a dam will be formed.

The common method of disposing of condensate is the use of a steam trap. However, these are often of incorrect capacity and it is not unusual for them to fail to dispose of air within the vulcanizer, and too many times they waste steam or fail to discharge the condensate sufficiently.

Here is where the condensate chamber with thermometer as installed with a complete automatic control system performs well, for it will discharge air and water when the temperature of its contents drops to a predetermined point, usually from 2° to 5° lower than vulcanizer temperature. Its operation is not dependent upon the amount of condensation it contains, but upon temperature which is the all-important requirement. With the use of either trap or condensate chamber caution must be used to prevent any back pressure upon their outlets which would prevent the ejection of condensate.

Properly insulating vulcanizers assists in maintaining desired temperature by aiding circulation to follow desired paths and preventing excess condensation.

After having a perfect vulcanizer in service it might be most disconcerting to discover that such curing-mandrels, pans, hollow forms, molds, etc., had been provided, or placed in vulcanizer in such position, that condensation had gathered within them, causing an under-cure of adjacent rubber product. It is well to provide such accessories of a design which will allow free circulation of steam and assist the heat coming into full contact with the product.

Spacing of Molds Important

Likewise, the location or spacing of the product or molds should be such as to permit free circulation and absorption of heat. Molds used in platen presses should be so designed and positioned in the press to insure uniform temperature in all parts of mold.

Many unusual vulcanizer conditions exist, making special application necessary. Reference is made to a vertical hydraulic tire heater where several tires on the bottom of the stack were usually found to be under-cured. This particular type of heater permitted water from the hydraulic cylinder to leak into the vulcanizing vessel and squirt up into the bottom molds with a decidedly cooling effect. A baffle, properly placed, deflected the undesired shower. Also, air pockets are sometimes formed within tire heaters when connections to air bags leak.

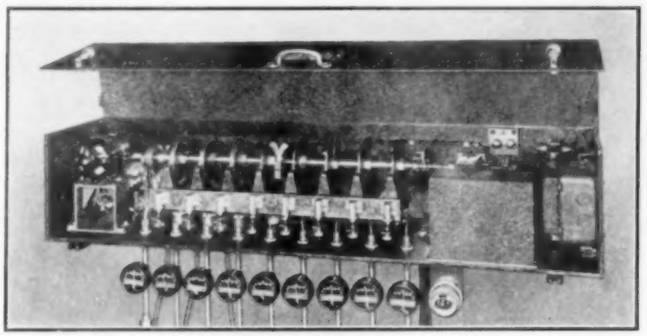
Perhaps all present vulcanizing methods may be considered unusual, particularly since the advent of the high-powered accelerators. Therefore, maximum effort is justified in overcoming those obstacles which interfere with maintaining uniform temperature, and which can in no manner be corrected by the automatically controlled temperature and pressure of the steam supply.

New Cycle Controller

THE C. J. Tagliabue Manufacturing Company, Brooklyn, N. Y., have recently developed a new TAG automatic cycle controller for tire presses, one of the models of which is shown in the accompanying illustration.

The apparatus consists of a long rotating shaft on which are mounted a number of cams. Each cam controls the operation of a separate diaphragm valve or other such device affecting the cure, the safety provisions, etc. The last cam does not operate a diaphragm motor valve but has time graduations so that the progress of the cure can be determined at any time. In a controller which must perform more automatic operations a longer cam-shaft would be furnished. Controllers of the cycle type can be built to handle practically any schedule of events.

The controllers are substantially built. The case and frame are steel with an attractive crystallized lacquer finish. The pilot air valves, levers, cams and other mechanism have been used in TAG controllers for many years and the dependability of these standardized parts has been well established,



TAG Cycle Controller

Electric clocks operated by alternating current are used for the air bag leak test cam-shaft and for the drive of the main cam-shaft.

Although not shown in the photograph, TAG cycle controllers are now supplied with a window in the front of the cover revealing a time dial and pointer. The pointer is connected to a jack-shaft which is bevel-geared to the main cam-shaft. A glance at this pointer tells the operator just how far the cure has proceeded. The window also makes visible the cam and lever for the air bag leak test.

Three signal lamps are connected to the controller. A white lamp is connected to the current supplied to the controller. If this light goes out it would indicate failure of the electric current driving the clocks and resetting motor. A red lamp is lighted if the air leak test shows excessive bag leakage and it stays lit while the controller is stopped for correction of this condition. A green lamp is lighted at the final termination of all operations.

Bulletin 967, published by the Tagliabue company, covers the operation of the cycle controller for tire presses.

Rubber Stock Curing Pans

THE stock pans illustrated below have recently been introduced by the Commercial Shearing & Stamping Company, Youngstown, Ohio, and are being used by several rubber manufacturers for tube and strip stocks.

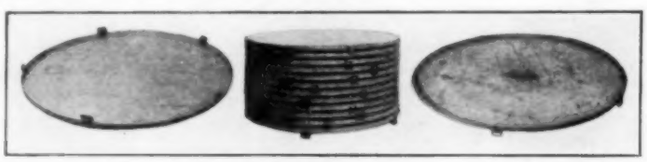


Fig. A **Fig. B** **Fig. C**

These pans are made in one piece of 14 gauge galvanized iron and are made in any diameter with any depth of flange Common sizes in use are from 36 to 42 inches diameter with ¾ to 1½ inches flange. They are equipped with five legs so that they can be stacked easily without the stock in each pan touching, as shown in Fig. A in the illustration. Fig. B shows the pans stacked up and Fig. C shows a pan with a handle in the center for lifting.

MAYOR JAMES J. WALKER

Rubber Exchange Holds Third Annual Dinner

Mayor Walker Speaks Before 250 Members and Guests—Evening Is One of Jollification—President Henderson Reports on the Increase in Tradings During the Year

"SIR" BARTLE BARTHOLOMEW DOYLE

THE third anniversary of the opening of the Rubber Exchange of New York, Inc., was the occasion of the annual dinner of the organization at the Hotel Roosevelt, on the evening of February 15, which was attended by about 250 Exchange members and guests. The evening was given over to pleasant conviviality. The banquet speeches, aside from the address of Francis R. Henderson, president of the Exchange, were limited to extemporaneous and humorous remarks from the Mayor of the City of New York, James J. Walker, and "Sir" Bartle Bartholomew Doyle, a well known humorist.

Mr. Henderson, in his speech surveying the past year's activities of the Exchange, made the interesting statement that within the past twelve months transactions totaling 45,000 tons had been traded in on the Exchange floor, an increase of 50 per cent over the amount handled the previous year and inasmuch as each transaction represented a buyer and a seller, over $460,000,000 was involved.

After reviewing the manner of trading on the Exchange and the advantage of "hedging" operations, he spoke of the valuable services to the industry in connection with the stabilization of crude rubber prices which are available to the individual manufacturers who use the Exchange.

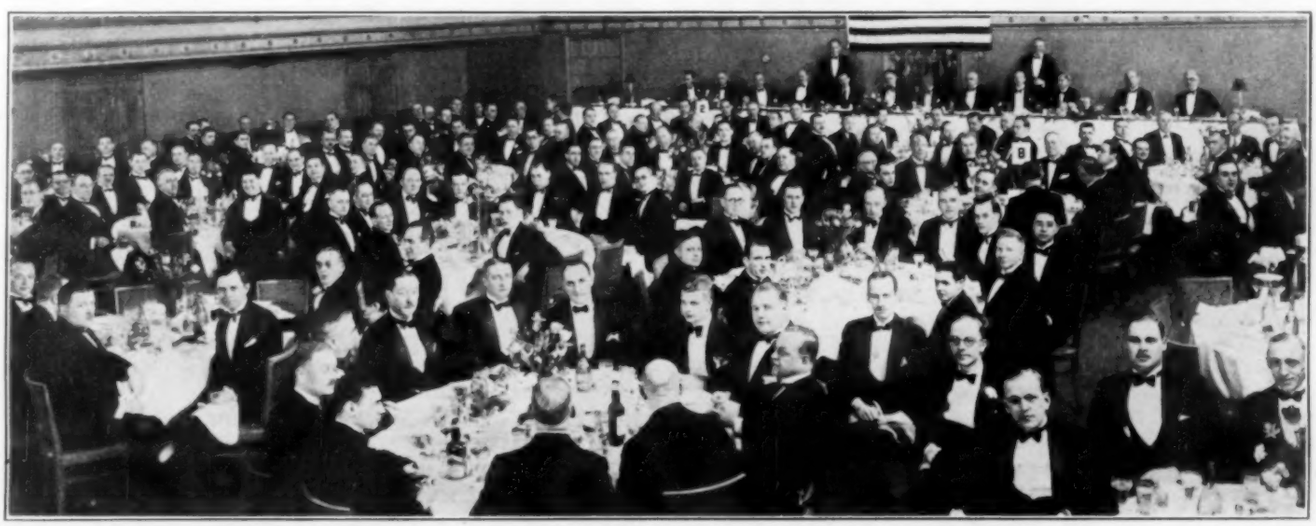
"The proper use of Exchange facilities can considerably minimize," he said, "if not entirely eliminate, the risks which have attended the building up of an industry so formidable and necessary as rubber is today. Rubber restriction was abolished last year because it was found to be a make-shift remedy for low prices. Low prices were found to be unsatisfactory for the consumer, and high prices proved but a boomerang for the producer. Concerted action on the part of either producer or consumer can never attain the desired result of a free and open market such as is provided by a properly functioning exchange. One of the purposes of an exchange is to disseminate to its members all information affecting both production and consumption, and with this information available, trading becomes a friendly battle for the opposing forces as to whether the commodity involved will go up or down based on the statistical position. Exchange machinery guarantees the proper performance of both sides of the contract, and the inevitable result is a price level representing the dictation of the economic law of supply and demand.

"For two and one-half years it was very difficult to attract public participation in the buying and selling of rubber, because the public insists that if they wish to exercise their own judgment as to values any law of fixation encroaches their freedom of action. This has been splendidly apparent since the abolition of the British restriction on production.

"Activity on the Exchange has become very much more pronounced, and while prices have moved up as a result they more truly represent the value of rubber than abnormally low or high prices did before.

"It has been estimated by those best qualified to know that America will produce about five million automobiles this year.

"It is estimated that eighty million tires will be produced



Banquet of the Rubber Exchange of New York, Inc., at the Hotel Roosevelt, February 15, 1929

this year. This would mean the same increase over last year that was experienced against the previous year.

"Obviously, such estimates are not too sanguine when general conditions in this country are considered. What, then, will be the effect on rubber prices? I sincerely believe that the potential supply of rubber in the world is ample for the year's requirements, provided the price will bring out the potential. There are areas from which we must obtain certain quantities of rubber where the cost of production is considerably higher than the more favorably situated and managed estates. Again the law of supply and demand will govern, and if the price is too low to bring the production we need, the tendency will be upward. If, on the other hand, the price reaches a point where new uses are not encouraged, or where too much rubber is available, the tendency will be downward.

"At all times our Rubber Exchange offers the best means of expressing divergent opinions, which result in the nearest we can expect to healthful stabilization."

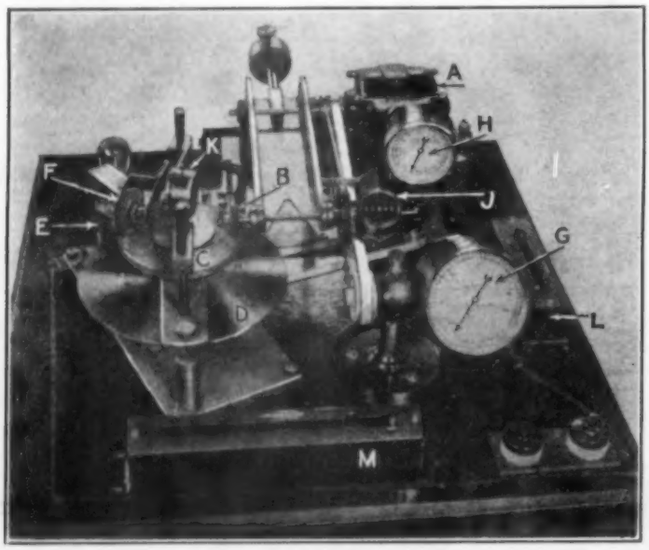
Mayor Walker spoke early in the evening in order to meet another appointment. While his speech was given in the best Walkerian style, full of apt humor, he also paid serious tribute to the functions of the Exchange and the position of importance it holds in the commercial life of New York.

Bartle Bartholomew Doyle, introduced by Mr. Henderson as Sir Bartle, gave a highly enjoyable talk which was colored with a running vein of dry humor that kept his listeners in continuous laughter.

New Machine for Testing Tires

A NEW and ingenious testing machine for tires has been recently developed by the research department of The Dunlop Rubber Company, Ltd., at Fort Dunlop, England. The machine has been described in a recent issue of *The Motor,* of Great Britain.

The machine is employed to investigate the rate of wear of the various kinds of "mix" used for tire treads. The tire



Dunlop Tire Testing Machine

is represented by a rubber wheel only 1¾ in. in diameter; the road by a 7-in. abrasive disc. The one drives the other, so that the rubber is subjected to the same stresses as in a tire tread and any pre-determined degree of slip can be made to occur between the two. The test continues until the little rubber wheel has rolled through a distance of one kilometre; it is then measured to ascertain the amount of rubber which has been worn away. Throughout the test a small brush sweeps the "road" continuously to remove rubber particles. Results are thus obtained which could only otherwise be arrived at by covering thousands of miles on the road and enable definite standards of performance to be set up and maintained. Accurate comparisons of the qualities of differing compounds can rapidly be carried out.

Apart from the saving of time, the laboratory test is found to be more accurate because a road test is apt to give somewhat misleading results owing to the many variable factors which influence the rate of tire wear, such as the speed, road surface, driving methods, type of car, and so forth. Consequently, there is obviously considerable scope for an abrasion machine which can be used in the laboratory, such as we have briefly described, provided that it gives results closely corresponding with road tests, and it should also subject the rubber compound to much the same stress conditions as those experienced by the tread of a tire.

The machine in question was evolved by Mr. L. J. Lambourn, of the Research Department of the Dunlop Rubber Company and has been used for some time by this concern with excellent results.

The abrasion machine is shown in the photograph reproduced, from which it will be seen that the rubber compound to be tested takes the form of a small wheel (B) mounted on a steel center and driven by means of an electric motor (A). This wheel is carried at the end of a weighted lever and rests upon a horizontal disc (C) forming an abrasive track; the disc is actually made of carborundum and is about 7 ins. in diameter. Rubber particles are removed by the brush (F).

Below the abrasive disc and mounted on the same spindle is a copper disc (D), the edge of which runs between a pair of electro-magnets (E) which form a sensitive eddy current brake when an electric current is allowed to pass through them.

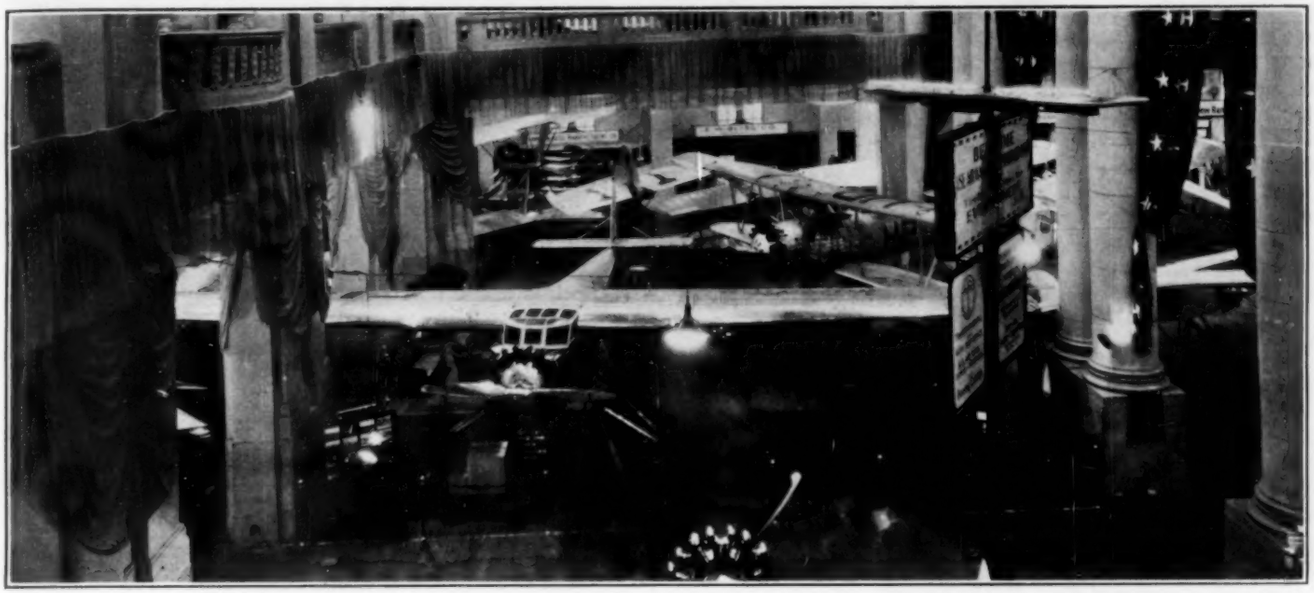
When the rheostat (L) is properly adjusted, the rubber test wheel rotates at 600 r.p.m., as shown by the tachometer (G), and its driving action causes the abrasive disc to rotate with practically no slip. Current is then allowed to pass through the electro-magnets, however, so putting a brake upon the abrasive disc, the potency of which is kept delicately adjusted by means of the rheostat (M) until the requisite amount of slip is occuring; in the ordinary way a slip of about 16 per cent is allowed to take place and the exact amount is recorded by the revolution counters (J, K). Thus, at the conclusion of a test the disparity between the readings of the revolution counters, which are driven from the rubber test wheel and the abrasive disc respectively, will show the amount of slip which has been taking place between the two.

The Chemical Exposition

THE twelfth Exposition of Chemical Industries, which will open at the Grand Central Palace, New York City, May 6th to 11th, bringing together thousands of chemists, chemical and research engineers, manufacturers and buyers from forty odd industries, is particularly significant of the advancement made in the chemical industries field during the last quarter of a century.

The various groups of this important industry as represented at the exposition will exhibit the most modern equipment and advanced practices of chemical engineering and chemistry. The exhibitors will include many of the chemical houses now supplying the rubber industry and it is expected that a number of features of the Exposition will be of special interest to the rubber manufacturing trade.

It is interesting to note that of the 40 industries which are dependent in their operations upon a chemical change in the nature of the material, or are under chemical control, 20 of them produce 17 per cent of all the products manufactured in the United States.



New Airplane Tires Are Exhibited at the New York Aviation Show

Casings of Leading Manufacturers Are Shown on Latest Planes, Although Rubber Manufacturers Offer No Displays of Their Own at Exhibition Held in the Grand Central Palace

WITH large crowds in attendance on every day of its duration, the New York Aviation Show, sponsored by Aviator's Post, No. 743, American Legion, proved a marked success in every respect. The interest shown in the exhibits displayed at the Grand Central Palace increased daily from the opening session on February 6, and many sales were reported as having been made before the end of the week.

Like other aeronautical expositions held in different parts of the country, this show attracted its share of interest among rubber and tire manufacturers and dealers. There were no actual exhibit booths maintained by makers of airplane tires or other rubber aeronautical products, but among the planes on display all the principal airplane casings were to be found. The show itself was not sanctioned by the Aeronautical Chamber of Commerce, and the planes displayed were shown by about 12 factory representatives, distributors and dealers in addition to some 17 manufacturers.

Practically all the planes on exhibit were equipped with tires supplied by the Goodyear Tire & Rubber Company, the B. F. Goodrich Company, the United States Rubber Company, the Fisk Rubber Company or the Firestone Tire & Rubber Company. Miss Amelia Earhart, only feminine trans-Atlantic flyer, was present with her Avrion monoplane equipped with Palmer aero tires.

The only rubber product specially exhibited was an Airaft shown in the booth of the Air Associates, Inc., Garden City, N. Y., which attracted considerable attention. This "boat in the bag," as it is described, weighs only a few pounds and can be inflated and made ready for service in a few minutes. The Superaft type has a gross buoyancy of 2,000 pounds and the Airaft 1,150 pounds. Either is furnished complete with oars, pump, carrying case and repair kit. Dead grass or high visibility yellow are the colors used, and carbon dioxide inflation and compressed gas bottles may be had at an additional cost. These boats are made of a rubberized fabric known as Flightex.

According to the manufacturers, Airships, Inc., Hammondsport, N. Y., these Airafts were selected and purchased for the overseas flights of Lindbergh, Byrd, Chamberlin, Maitland and Hagenberger, Schlee and Brock, Goebel and Davis, Hassell and Cramer, Jensen and Schluter, and Mears and Collier. They are also carried on United States Army, Navy and Coast Guard planes and are used by sportsmen for hunting, fishing, aquatic sports and as tenders for yachts, cruisers and seaplanes.

Among the other rubber products to be seen on the various planes at the exhibition were airplane tubes, streamline pontoon hand hole covers, shock absorber discs, shock absorber tubing, airplane matting, aircraft radiator and gasoline hose, rubberized fabrics, rubber tank covers, rubber couplings, pneumatic rubber cushion seats, and special moulded goods, such as rubber grommets and handle grips.

That other automotive manufacturers besides tire companies are realizing the possibilities of the aviation field was shown by the number of products on exhibit bearing the names of firms well known in the automobile world. Isotta Fraschini, Continental, Velie and other well known manufacturers were represented by their engines, and the Robert Bosch Magneto Company maintained a booth to show its magneto products. Other well known manufacturers included the Snap-On Wrench Company, Texas Pacific Coal & Oil Company, Tidewater Oil Sales Company

and the Heywood Starter Company. Magneto makers, wire wheel and brake manufacturers, machine parts concerns, body and fabric makers, and numerous others, heretofore exclusively confining their production to the automobile industry, have recognized the coming extent of the aviation field and are preparing to take advantage of this market for their products.

A feature of the show was the Lockheed Air Express, which Captain Frank Hawks had just piloted direct from

Miss Amelia Earhart, Famous Female Trans-Atlantic Passenger, Beside Her Avion Monoplane Equipped With Palmer Aero Tires

Los Angeles across the continent in the record breaking time of 18 hours, 21 minutes and 59 seconds. This plane, powered with a Pratt & Whitney "Wasp" engine (N. A. C. A. cowling), attracted considerable interest in view of the fact that Captain Hawks was on hand to discuss his flight and answer questions.

The most prominent single exhibit was that of the products of Columbia Air Liners, Inc., of which Charles Levine is president. Three planes and an engine were on display, including an all metal inverted Packard powered mail plane, a small single seater monoplane for sport use, and a new convertible amphibian with a Wright Whirlwind engine. Other types of planes shown either by the manufacturers or by dealers were the Bellanca, Bourdon, Brunner Winkle, Buhl, Chance Vought, Hamilton, New Standard, Szekely, Aeromarine Klemm, Moth, Crescent, Mill Basin, U. S. Aircraft, Ryan, Swallow, Travel-Air, Lockheed Vega, and Command-Aire.

Sunproof

SUNPROOF is a new material offered by the Naugatuck Chemical Company for use in rubber goods to prevent the checking or cracking that so commonly results from exposure to sunlight.

Sunproof has the following characteristics: Color,—pale lemon, granulated in form, M. P.,—68°-78° C., Sp. Gr.—0.95. It is odorless, non-toxic, has no effect on rate of cure, and has no effect on color of goods during or after cure. It has very little effect on the plasticity of uncured stock, and no bad effect on ageing. It is said to be three to five times as effective as the best grade of paraffine wax.

It does not bloom out as readily as paraffin and is therefore applicable to a great many more lines of goods, particularly as smaller amounts are so effective.

Thorough distribution in the rubber batch is essential in order to obtain the maximum effect. The manufacturers recommend that Sunproof be ground into the rubber before other compounds are added. This can be done as the crude rubber is being broken down.

Use of Rubber in Surgery

DR. M. P. DELBET, a French surgeon, has recently published an interesting account of his experiments with rubber in surgical work in *Le Revue de Chirurgie,* of France and reprinted in the *Bulletin* of the Rubber Growers Association, of Great Britain.

Dr. Delbet discovered a piece of rubber in a human jaw which was still supple and elastic. As it had acted as a drain for some twenty years the final condition of the rubber was indeed remarkable. He at once turned his attention to the use of rubber as a mechanical agent in surgery. Experiments were first carried out on an animal with gratifying results. The animal appeared to suffer no inconvenience, but due to faulty attachment certain defects soon became apparent.

Strengthened rubber tubes were next employed and it was found that the animal began to walk without pain immediately it came out of the anaesthetic. Like bone, the rubber will not stand any permanent unnatural pressure without fracture. On the other hand rubber is not considered a "foreign body" when embedded in animal tissue, due, according to Dr. Delbet, to the similarity between the vegetable colloid in rubber and tissues.

The next step was to replace a diseased tendon in a man's hand and this was done with a complete recovery of movement.

Several operations have been performed on patients with encouraging results. The only drawback is that the slightest infection results in the removal of the rubber either by natural process or compulsorily.

In using rubber to replace bone it has been found necessary to reinforce it with metal. Not only may the rubber replace long bones, but it may also be useful for joints which refuse to bend.

The introduction of the rubber may be so life-like that, as far as appearance is concerned, detection is impossible.

It has been used to replace the windpipe, and after further experiment may be made to replace the soundbox and swallowing apparatus. The main drawback to its adoption appears to be the difficulty of sterilization when in contact with non-sterile material, and its inability to withstand continued pressure. These defects deserve the personal attention of the rubber manufacturer.

New Uses for Rubber in Chemical Plants

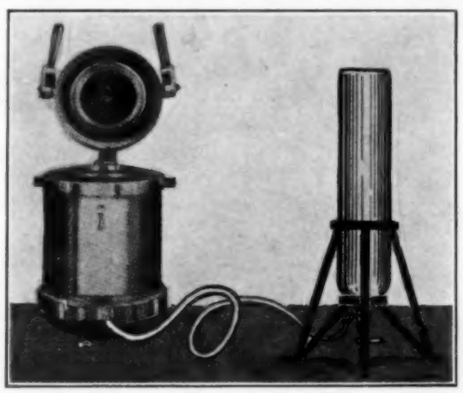
THE rapid growth of the hydrometallurgical industries in Great Britain is giving a stimulus to the construction of plant on a large scale to resist hydrochloric acid and its solutions. Price forbids the use of old stone tanks, ebonite lining, glass and earthenware. Research on the wet treatment of complex sulphide ores has brought into use self-curing rubber compounds which can be applied to existing plant in situ. This is distinct from the sticking of soft rubber to iron and wood vessels by means of rubber solution, which has been known for 20 years. The application of rubber compounds to existing plant is a new development. It began with the erection of an experimental works at Stratford, where the entire plant was constructed of a special compound known as Cabtyrit. The compound was applied by means of solution of rubber to the inner surfaces of the iron plant in the form of sheets, the joints being made by simply welding with hot tools. The work was done by semi-skilled labor under the supervision of a staff no member of which had been inside a rubber factory. Cabtyrit resists the action of hydrochloric acid and its solutions at a temperature of 105 degrees C. It does not expand or contract, and is tough enough to crack with slight changes in the shape of the ironwork. When

thoroughly cured it resists abrasion extremely well, a characteristic necessary for treating ground ore which is as hard as carborundum.

The fact that rubber cannot be attached to wet surfaces restricts its use to new wood and iron plant. Recently there has been developed what is known as the Nordac process, whereby any rubber compound can be applied to any material in a wet and defective condition. A preparation of cement and stabilized latex, which is wet, is applied to the existing tank and sets to a yielding linoleum-like layer to which the rubber compounds are attached. This has enabled many existing chemical plants to be protected. Developments are still proceeding and now acid tanks constructed entirely of a rubber concrete reinforced with steel are being erected. They are used as storage tanks for hydrochloric acid, waste pickle from galvanizing works. copper salts and most acid solutions, not even excepting those containing chlorine, bromine and nitric acid

Carbo Freezer

A NEW and compact piece of laboratory equipment has been developed by the Carbo-Freezer Company, 11 West 42nd Street, New York City. The apparatus produces automatically and practically instantly, solid CO_2 and is particularly applicable for industrial and private



laboratories where extreme cold temperatures or sudden temperature changes are necessary for experimental tests, etc.

The Carbo-Freezer is six inches in diameter, ten inches high, weighing 19 pounds, automatically solidifies CO_2 into compressed discs or soft snow. It can be operated by anyone, by opening the valve and waiting thirty seconds. The valve will close automatically and the disc is made.

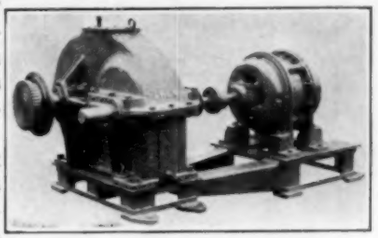
No power is required as the Carbo-Freezer is operated by the pressure in the gas cylinder.

New Falk Speed Reducers

AFTER a series of exhaustive tests, the Falk Corporation, Milwaukee, Wis., have added certain improvements to their line of standard speed reducers which are the culmination of the experiments and research work carried on during the last few years.

Several new sizes have been added which include four new single reduction units, three triple reduction units, plus nine sizes of single reduction units with vertical centers now making a total of forty-eight different sizes in all. The program of standardization which was started in 1925 has reached a point where even the ratios have been included. Now every reducer of a given type has the same series of standard ratios from the smallest to the largest unit.

A complete line of welded steel motor beds has been added which means that each unit can be had with a welded steel or a cast iron motor bed. When a speed reducer is mounted on timbers, structural steel or any other foundation other than concrete, there is some advantage in using welded steel motor beds because of the greater strength. A double reduction unit mounted on a welded motor bed is shown in the accompanying illustration.



Another improvement of considerable note is the new method of forging pinions. They are not machined from ordinary bar stock but are made of heat treated chrome vanadium steel by the upset forging process. This method of manufacture produces greater strength and toughness as the fibres of the steel are continuous, a condition which does not exist when pinions are forged in the ordinary manner. The smaller gears are made of drop forgings while the larger ones are made of "Telastic" steel—a special gear material developed and made by the Falk Corporation.

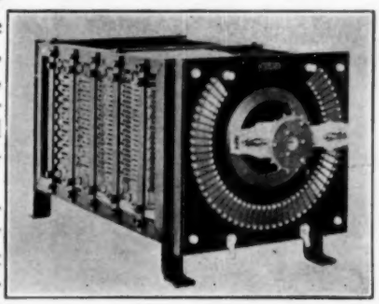
Through bolts, made of heat treated steel, are used throughout the entire line of Falk standard speed reducers.

Falk airplane type sleeve bearings remain unchanged. During the tests conducted recently, in which several reducers were loaded to the breaking down point, gear teeth were destroyed and alloy steel shafts were twisted but the bearings stood up under the load. This type of bearing has been used on Falk reducers for the last three years and although thousands are in service, none have ever worn out or have needed replacement.

A new lubrication plate attached to the base of the gear case gives instructions as to the proper grade of oil to be used under every conceivable operating temperature and condition. These recommendations are based on recent tests performed under actual operating conditions with various oils of different manufacture.

Radial Switches With Renewable Segments

A COMPLETE new line of radial rheostat switches, for varying the fields of large electric machines such as generators, motors, etc., is announced by the General Electric Co., Schenectady, N. Y. The switches are for general application where the current is more than 50 amperes and not over 300 amperes. There are five forms, for hand, sprocket, gear, solenoid, motor and sprocket operation. The latter model is shown in the accompanying illustration.



The outstanding advantage of the new switches is the fact that they have renewable segments. By removing two screws any segment may be taken off without disturbing the resistor leads. The segments may be reversed for increased service.

The switch designed for 100-ampere service has 65 divisions; the 200-ampere switch has 48 divisions, and the 300-ampere switch has 40. All switches of a given current rating have the same number of divisions, irrespective of how they are operated. Thus, if the user wishes to change from a sprocket-operated switches to a solenoid- or motor-operated one, he can exchange the switches and reconnect the leads, having the same number of governing points.

Schaphorst's CHATS *with the* ENGINEER

By W. F. SCHAPHORST, M.E.

Rubber Belt Tension

HERE is a handy rule for determining the tension in a rubber belt that is slack enough so that the sag can be measured. The tension can be computed easily—without the necessity of expensive or complicated apparatus. Proceed as follows:

Multiply the width of the belt in inches by its thickness in inches; then multiply by 0.54; and we will call the answer "P".

Now, multiply "P" by the sag of the belt in feet; and we will call the answer "A".

Next, multiply "P" by the distance between pulleys in feet; multiply that again by the distance between pulleys in feet; multiply by 0.125; and divide by the sag of the belt in feet; and we will call the answer "B".

Lastly, add "A" and "B" and the result is the exact total tension in the belt in pounds.

No matter what the sag is, if it is only a half of an inch, or any sag within reason, the above rule will figure it out. It may sound cumbersome, but after once getting started it is easy.

For example, let us take a case where the distance between pulleys is 20 ft.; the sag is 6 in.; or equal to 0.5 ft.; the belt is 6 in. wide and ¼ in. thick. What is the total tension?

Applying the above method we get:

$$P = 6 \times \tfrac{1}{4} \times 0.54 = 0.81$$

$$A = 0.81 \times 0.5 = 0.41$$

$$B = \frac{0.81 \times 20 \times 20 \times 0.125}{0.5} = 81$$

$0.41 + 81 = 81.41$ pounds = total tension.

The Weight of Belting

THE above reminds me that every once in a while somebody wants to know the weight of belting. Unfortunately there are very few handbooks and catalogs that give the weights of the various types of belts used in industry. I find the following weights in one of my books—for three types of belting:

Rubber	0.045 lb. per cu. in.
Oak tanned	0.035 lb. per cu. in.
Cotton and Canvas	0.026 to 0.05 lb. per cu. in.

In computations that I have made I find that hair belting weighs approximately 0.035 lb. per cu. in., and high grade mineral tanned leather belting weighs about .030 lb. per cu. in.

In this connection, users of belting will doubtless be interested in the following table which I have copied from Bulletin No. 41 of the Ohio Engineering Experiment Station entitled, "Transmissive Power and Stretch of Belting," by Prof. C. A. Norman and Prof. G. N. Moffat:

Kind of Belt	*Weight per ft., pounds*
Rubber No. 1	0.266
Balata	0.268
Stitched Canvas	0.36
Oak Tanned Leather	0.209
Mineral Tanned Leather	0.162
Hair	0.314
Solid Cotton	0.199
V-belt, rubberized	0.196

Those belts were all equivalent to single-ply leather in thickness and 3 in. wide. Of course it is difficult to compare rubberized V-belting with flat belting in this manner.

January Rim Production Gains

OUTPUT of automobile and other rims during January, while only slightly higher than that of January, 1928, was considerably above the production figures for December. During the past month the number of rims reported as inspected and approved by the Tire and Rim Association of America, Inc., totaled 1,835,207 as against 1,101,193 in December and 1,811,534 in January of last year. The gains over December production were especially marked among the 19- and 20-inch rims, while the 21-inch size showed a decrease in output.

Rim Size	Jan. 1929 No.	%	Jan. 1928 No.	%
MOTORCYCLE				
28x2½	——	—	——	—
24x3 CC	3216	0.2	*4072	0.2
24x3 Std.	4200	0.2		
26x3 CC	756	0.0	*428	0.0
26x3 Std.	——	—		
28x3 CC	337	0.0	*452	0.0
28x3 Std.	——	—		
Total	8509	0.5	4952	0.2
CLINCHER				
30x3½	45539	2.5	42306	2.6
Total	45539	2.5	42306	2.6
18" BALLOON				
18x3½	——	—	8785	0.5
18x4	83694	4.6	116707	6.4
18x3.25	20077	1.1	——	—
18x4½	21112	1.2	4595	0.3
18x5	6824	0.4	——	—
Total	131707	7.2	130087	7.2
19" BALLOON				
19x2.75	23216	1.3	——	—
19x3½	149585	8.2	81346	4.5
19x4	298345	16.3	175035	9.7
19x3.25	26519	1.4	——	—
19x4½	17189	0.9	66404	3.7
19x5	3519	0.2	——	—
Total	518373	28.3	322785	17.9
20" BALLOON				
20x2.75	424180	23.1	——	—
20x3½	21530	1.1	46655	2.6
20x4	213110	11.6	261867	14.5
20x4½	53635	2.9	61065	3.4
20x5	42916	2.3	45525	2.5
20x6	16976	0.9	9201	0.5
20x6.75 DC	538	0.0	——	—
Total	772885	42.1	424313	23.5
21" BALLOON				
21x2.75	——	—	502937	27.4
21x3½	18987	1.0	70730	3.9
21x4	8935	0.5	81935	4.5
21x4½	5852	0.3	59344	3.3
21x5	——	—	985	0.1
Total	33774	1.8	715931	39.2
22" BALLOON				
22x4	——	—	——	—

Rim Size	Jan. 1929 No.	%	Jan. 1928 No.	%
HIGH PRESSURE				
30x3½-23	6188	0.4	3524	0.2
32x4½-23	7606	0.4	3183	0.2
32x4 -24	1228	0.1	3238	0.2
33x4½-24	——	—	406	0.0
33x4 -25	——	—	683	0.0
Total	15022	0.8	11034	0.6
20" TRUCK				
30x5	254682	13.9	128020	7.1
32x6	28814	1.6	15429	0.9
34x7	10409	0.6	6663	0.4
36x8	5142	0.3	3044	0.2
40x10	——	—	470	0.0
Total	299047	16.3	153626	8.6
22" TRUCK				
36x7	——	—	282	0.0
38x8	6	—	——	—
Total	6	0.0	282	0.0
24" TRUCK				
34x5	2	0.0	2730	0.1
36x6	4552	0.2	2052	0.1
38x7	2541	0.1	553	0.0
40x8	1496	0.1	716	0.0
44x10	——	—	167	0.0
Total	8591	0.4	6218	0.2
AIRPLANE				
8x3 SS	15	0.0	——	—
12x3 SS	24	0.0	——	—
16x3½ SS	919	0.0	——	—
20x4 SS	6	0.0	——	—
20x5 SS	2	0.0	——	—
20x6 SS	217	0.0	——	—
20x8 SS	215	0.0	——	—
18x4 Cl.	356	0.0	——	—
Total	1754	0.1	——	—
GRAND TOTAL	1,835,207		1,811,534	

*Motorcycle Rims not divided as between CC and 3" Standard, in 1928.

Tire Output in 1928 Over 78,000,000

PRODUCTION of pneumatic, solid and cushion tires of all types during 1928 reached a record total of 78,113,325. Of these, 77,943,917 were pneumatic casings as against the previous record of 64,439,000 casings produced in 1927. Shipments of pneumatic casings during the year totaled 74,295,916, leaving stocks in the hands of manufacturers at the end of the year amounting to 13,623,611 casings. December production was slightly below that of November, but considerably above that for December, 1927.

The figures for December, as released by the Rubber Association of America, Inc., represent 75 per cent of the total industry in the United States and have been brought up to represent 100 per cent in the following table:

TIRE AND TUBE PRODUCTION
(All Figures Represent Thousands)

	November, 1928 Prod.	Ship.	Inven.	December, 1928 Prod.	Ship.	Inven.
Pneumatic Casings:						
All types	6,075	4,998	12,579	5,605	4,591	13,624
Balloon	3,834	3,240	8,257	3,681	3,162	8,793
High Pressure Cord	2,219	1,740	4,263	1,913	1,415	4,774
High Pressure Fabric	22	18	59	11	14	56
Solid and Cushion Tires	48	50	201	42	41	203
Inner Tubes:						
All types	5,592	5,002	15,743	5,184	4,858	16,117
Balloon	3,025	2,984	9,156	3,272	3,093	9,400
High Pressure	2,572	2,017	6,604	1,912	1,775	6,717

RUBBER CHEMISTRY and Technology

Color Reactions of Rubber and Gutta-Percha*

By F. KIRCHHOF

THE present paper was suggested by a recent publication of Pauly[1] on the same subject, who applied the well known sterol reactions of Hesse, Liebermann, Tschugajeff, etc., to the hydrocarbons of rubber and gutta-percha. These reactions depend either upon the action of concentrated H_2SO_4 on chloroform solutions of the substances in the presence or absence of acetic anhydride (Liebermann, Burchard and Hesse reactions) or other solvents, or condensation reagents are used, such as acetyl chloride and zinc chloride by Tschugajeff, and acetic acid with arsenic trichloride by Kahlenberg, and trichloroacetic acid with a trace of formaldehyde by Godoletz.

All the known sterol reactions take place also with rubber or gutta-percha, with the appearance of intense red or violet colorations of varying stability, the color depending in part upon the quality and in part upon the purity of the samples.

The Burchard reaction in particular is very sensitive in these respects. Thus with rubber purified with alkali by the Pummerer method, the color is a Bordeaux red which does not change for a long time, whereas solutions of unpurified rubber change rapidly, a change which is rightly ascribed by Pauly to relatively rapid oxidation in the presence of oxidation products in the case of the unpurified rubber.

All changes in rubber brought about by concentrated sulfuric acid depend upon the formation of sulfo-acid cyclorubbers, as numerous earlier researches of Kirchhof[2] and others have shown, a fact which is apparently not known by Pauly.

This applies also to the reactions with hot trichloroacetic acid, as shown by patents of the Goodrich company, data which I was able to confirm. With rubber or gutta-percha and trichloroacetic acid, the fused mixture becomes yellowish-red, and on raising the temperature to the boiling point (195-196° C.) the color becomes an intense dark orange-red. On solution of this fusion mixture in water a gray-violet precipitate settles out, which on exposure to air acquires a yellow-ochre color. When the precipitate is dried out of contact of the air, a yellowish-white powder is obtained, which added to fused trichloroacetic acid forms again a reddish-yellow solution.

This fusion mixture has then all the aspects of a colloidal solution of isomeric rubber hydrocarbon, which has been termed trichloroacetic acid-rubber, and the behavior of which indicates that it is related to the metal halide rubbers of Bruson.

The bromide of this isomeric rubber was a light yellow powder partially soluble in alcohol. In order to avoid oxidation of the readily oxidized isorubber, it was prepared by direct bromination in trichloroacetic acid.

Trichloroacetic acid has then an isomerizing action on rubber similar to that of concentrated sulfuric acid. Since trichloroacetic acid also gives characteristic color reactions with a series of other unsaturated cyclic hydrocarbons, the Tschugajeff-Godoletz reaction and similar reactions probably involve transitory addition of the trichloroacetic acid (or sulfuric acid) onto the free bonds, with formation of cyclorubbers, which, because of their colloidal state at the moment of formation, show an intense coloration. By solution of the trichloroacetic acid fusion mixture in water, there appears a turbidity and then a separation of the isomeric rubber in flocculent form.

The appearance of these colors cannot therefore be considered to be a proof of the original existence of a ring structure in the rubber hydrocarbon, as assumed by Pauly, but a result of cyclization or a rearrangement in the rubber molecule during the reaction.

The *relatively great tendency of rubber hydrocarbons toward cyclization* is accordingly the cause of the colorations in these reactions.

Much more characteristic and older, though unfortunately little known, is another color reaction of rubber hydrocarbons. It was first observed by Weber[3] in 1900 when he applied the Friedel-Crafts reaction to rubber dibromide $(C_5H_8Br_2)x$. This reaction depends upon a conversion of halogen-hydrocarbons with phenols in the presence of catalysts, *e. g.*, $AlCl_3$.

The characteristic color reaction of rubber dibromide, *i. e.*, an intense blue to red-violet, does not appear in the presence of catalysts such as $AlCl_3$, $FeCl_3$ or $ZnCl_2$, for in this case the fusion mixture is yellowish brown. This may account for the fact that this color reaction has often been overlooked.

Weber succeeded in isolating from the yellow-brown fusion mixture a substance of the composition $[C_5H_8(OC_6H_5)_2]$, which was soluble in alkalies. Since, according to Weber, phenolic ethers do not under the same conditions react with rubber bromide, he concluded that it was not the *p*-hydrogen atom of the phenyl group but that of the hydroxyl group which reacts with the bromine atom of the dibromide, with formation of ether-like phenol compounds of rubbers. Only recently did Fisher, Gray and McColm[4] repeat the experiments and show that the hydrogen atoms of the hydroxyl group are replaceable by methyl groups, and therefore that the

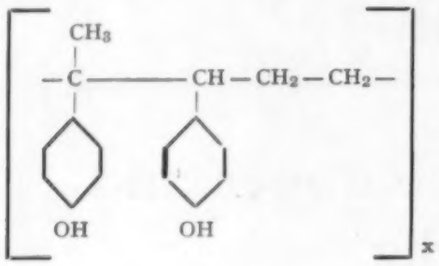
*Reprinted after translation from *Kautschuk*, Vol. 4, No. 9, pp. 190-192 (1928).

Weber Color Reactions of Various Rubber Hydrocarbons and Some Other Substances

Substance	Color of Bromide	Color of Phenol Fusion Mixture	Color of Fresh Solution of Fusion Mixture in			
			Chloroform	Carbon Tetrachloride	Acetic Anhydride	Ether
Pure rubber (Ceylon crepe)	yellowish-white	blue-violet	blue-violet	blue-violet	reddish-yellow	yellow
Pure gutta-percha (Tjipetir)	white	blue	blue	blue-violet	reddish-yellow	yellow
Oxidized gutta-percha	yellowish-white	carmine-red	carmine-red	carmine-red	reddish-yellow	yellow
Synthetic rubber H	yellowish-white	cherry-red	cherry-red	cherry-red	.....	yellow
Sulfocyclorubber	yellowish-brown	carmine-red	cherry-red	cherry-red	.....	yellow
Trichloroacetic acid-rubber	light yellow	reddish-brown	reddish-brown	reddish-brown	.....	yellow
Rosin oil	light brown	reddish-brown	reddish-yellow	reddish-yellow	.....	brown
Rosin	light brown	reddish-yellow	reddish-yellow	reddish-yellow	.....	brown

reaction takes place between bromine and the *p*-hydrogen of the phenols.

In this transformation, accordingly, no phenyl ether of the rubber hydrocarbon is obtained, but hydroxyphenyl derivatives of hydrorubber of the following constitution:



This constitution explains, among other things, their solubility in alkalies.[5] These hydroxyphenyl derivatives have, as already mentioned, a brown color. In the absence of catalysts and with relatively pure reagents, splendid blue to red-violet colored fusion mixtures are obtained, the color being stable for several days. The fusion mixtures change color when poured into organic solvents. Thus in ether the violet color changes to yellow-brown, in acetic anhydride to reddish-brown, while in chloroform and in carbon tetrachloride the original color remains unchanged for a long time, but ultimately changes to green, to greenish-brown, and finally to brown, with separation of a brown flocculent precipitate.

The characteristic violet color of the phenol fusion mixtures of the bromides of rubber and gutta-percha in the absence of catalysts, which may appropriately be called the *Weber color reaction*, is to all appearances a typical dispersion color reaction depending primarily upon the size of the dispersed particles. This size depends in turn upon the concentration, temperature and occurrences of secondary chemical reactions. On this basis the natural impurities in rubber (oxidation products) also play a part, under which conditions the blue-violet color of the fusion mixture of the pure bromide becomes red-violet or cherry-red. The latter color is also observed with the bromide of sulfocyclorubber, as shown in the table.

To what extent these various color reactions allow conclusions on the constitution of rubbers is left in doubt, but they do permit an *estimate of the purity of a sample.*

Technique and Sensitivity of the Weber Reaction

After preliminary extraction with acetone, swell or dissolve a few cubic centimeters of finely divided sample (in which rubber or gutta-percha is to be identified) in carbon tetrachloride and brominate in this liquid. To this end suspend a few milligrams of the bromide in 2-3 cc. of carbon tetrachloride, add 1-2 cc. of highly concentrated phenol solution (or the corresponding quantity of crystallized phenol), warm gently, to distil off the CCl_4 and then heat gradually to the boiling point. If rubber or gutta-percha is present, the fusion mixture acquires a characteristic blue to red-violet color.

A few drops of the mixture may be poured into various organic solvents, *e.g.*, chloroform, ether or acetic anhydride, and the new color observed (see Table).

It is interesting to note that hexahydrophenol (cyclohexanol) and phenetole do not give the characteristic violet color, but only a yellow-brown color, which with phenetole appears only slowly.

On the other hand, when heated with pyrogallol, rubber dibromide gives a cherry red color and with resorcinol a dark orange-red or shellac color. Like the violet phenol fusion mixtures, these fusion mixtures are soluble in alcoholic potassium hydroxide, giving intense yellow-brown solutions (potassium salts of the corresponding hydroxyphenyl hydrorubbers). None of these last named fusion mixtures has so characteristic a color as the phenol fusion mixtures of the dibromides of rubber, gutta-percha and balata.

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(2) *Kautschuk* 4, 142 (1928).
(3) *Berichte* 33, 791 (1900).
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(5) Geiger, *Helvetica chim. acta* 10, 530 (1927).

Huber Expands Operations

THE J. M. Huber Company has embarked on an extensive building program to greatly increase its carbon black and clay production. More than $1,500,000 will be spent during the next few months for the erection of new factories.

Of great interest to the rubber trade, is the entry of Huber into the Panhandle carbon black field, with a large plant under construction at Borger to produce approximately fifteen million pounds per year. Plans are also under way for another plant to be started later on in the Spring, bringing the total number of Huber-owned carbon plants to eight.

Huber has also announced the acquisition of a new clay property, comprising about 380 acres, at Langley, South Carolina, which is located about 7 miles from the present Suprex Clay mines. The new clay at Langley will be sold under the brand "Paragon Clay," and the entire current output has been contracted to the paper industry. New equipment is being added to double the present capacity within three months.

The history of the Huber Company presents an interesting picture of the evolution of an American industrial firm. Nearly fifty years ago the business was established in this country as American representatives of Michael Huber, one of the leading European color manufacturers. Owing to tariff conditions, a dry-color factory was soon built on this side, and for many years the firm has been one of the most prominent in this line of business. Having become intimately associated with the printing ink industry, as the major outlet for fine dry colors, the company started to manufacture inks in 1890. This business developed rapidly to the point where Huber soon became one of the largest ink producers in the country, which position it has maintained ever since. The manufacture of inks required the use of carbon black in considerable quantity. A shortage developed about fourteen years ago, when it became impossible to secure sufficient supplies of uniform quality for the operation of the company's ink factories. Huber quickly acquired a natural gas supply in West Virginia, which was then the center of carbon black production, and erected a factory. At this time the company engineers developed a number of distinctive features in carbon black plant design and operation, tending towards better control of uniformity, and operating economy.

Shortly after the Monroe, Louisiana, gas field was discovered, Huber acquired extensive acreage there, and brought in some of the largest wells in the district. Here was erected a four unit carbon black factory which at the time was one of the largest individual carbon black plants ever built. The company recently increased its Louisiana interests by absorbing the Weston Carbon Company and the Ebony Carbon Company. Huber was one of the pioneers in Texas, having built a factory at Breckenridge five years ago and later on acquired another at Caddo, in the same field. Two years ago another factory was built in the Lance Creek field of Eastern Wyoming, and this is the only one now producing carbon black in that State.

Suprex Clay was later offered as a companion ingredient for rubber, and also a line of concentrated organic colors prepared especially for vulcanization conditions.

Originally developed as a by-product, the rubber pigment sales have reached a volume surpassing that of the company's printing ink business and the two divisions are operated practically as independent corporations. J. M. Huber, Incorporated, is a closed corporation, owning all its factories independent of outside interests. Subsidiary companies include J. M. Huber Co. of La., Inc., J. M. Huber Pigment Co., Inc., and J. M. Huber, Limited.

Tire Manufacture Throughout the World

(*Continued from page* 546)

has equipment for the production of solid tires. These are made to order, and but twenty were made during 1928.

The production of automobile tires in Mexico was begun in October, 1925, by Cia. Hulera El Popo. For a time the local production did not figure to any great degree in foreign competition, in fact for a while local production was suspended, but recently sales have increased until at present it is estimated that Popo is the seventh most popular make in the market of the Federal District. Furthermore, by decree, all official cars and trucks are required to use Popo tires. The daily production of the plant is from 40 to 50 tires and from 160 to 200 inner tubes. It is reported that the company is now selling all that it can produce.

Six countries, the Union of South Africa, Brazil, Finland, Cuba, Latvia, and Poland, comprise the fourth group. At one time or another these States have produced tires, but at present it is believed that production is suspended.

South African Production Small

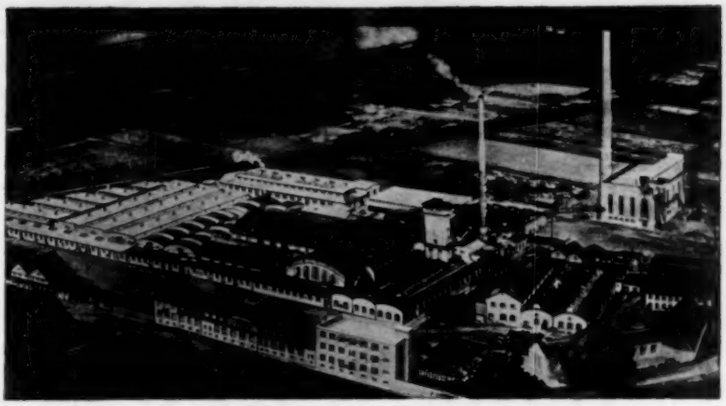
The paramount rubber manufacturing concern of South Africa is the South African Rubber Manufacturing Co. (Ltd.), a subsidiary of George Spencer Moulton & Co. (Ltd.), and Wood-Milne (Ltd.), of Great Britain. It has experimentally produced pneumatic tires and inner tubes and a certain quantity has been manufactured for commercial use. The output, however, is negligible and the domestic consumption of automobile casings is supplied wholly by importation.

Until 1925 tires and inner tubes were produced in Brazil by the Companhia Brasileira de Artefactos de Borracha, of Rio de Janeiro. Prices were considerably below those of imported tires, but the quality was reported to be quite inferior. With the introduction of the balloon tire, the manufacture of which the factory is said to have been unable to accomplish successfully, the company ceased to function.

The Brazilian press has recently announced the fact that the French Michelin company has approached the government of the State of Amazonas for permission to establish in that State a factory for the manufacture of automobile tires. The plant would benefit by being in the heart of the Brazilian wild-rubber area, with ample water communication to other parts of the country. With these favorable factors, there are many negative elements to be considered. The climate is a hindrance and besides the State of Amazonas is a long distance from the centers of Brazilian tire consumption.

A/B Treugolnik, the local rubber manufacturing company of Finland, for some time has seriously considered the production of automobile tires. It has beeen bringing pressure to bear on the Government in order that its industry might be protected by a high import duty. To date the company has done nothing definite toward a tire department. The company manufactures galoshes, overshoes, and many other kinds of rubber goods. It was formerly part of the well-known old Russian company of Leningrad of the same name.

The manufacture of tires has also been tried in Cuba and during 1924 the operation of the Fabrica Cubana de Gomas at Puentes Grandes, near Havana, was resumed,



Dunlop Rubber Company of Germany, Located at Hanau

after remaining idle for many months. It is believed, however, that at present, all production of tires has been suspended.

The Baltic Republic of Latvia inherited the larger number of the rubber factories of the former Russian Empire. At present rubber production of manufactured goods have reached a considerable degree, especially in rubber footwear. Attempts have been made at the production of automobile tires by the Riga factories, but as yet, they have proved unsuccessful.

Tires have been produced in Poland by the Pepege Rubber Co., of Grudziadz, but have met with very little success. The plant has been successful in the production of galoshes, athletic shoes, and proofed outer garments and has succeeded in exporting a certain amount of its production. Recent reports credit the company with the intention of reestablishing its tire department and it is rumored that it has ordered improved machinery from Germany for this purpose. The same is true of the Kauczuk company at Bydgoszcz. Furthermore the Provodnik company of Riga is negotiating for a site in Warsaw with the intention of building a tire manufacturing plant.

In the fifth and last group, the potential producers, may be mentioned Argentina and Peru. The former is now the largest market which is supplied wholly by foreign-made tires. Foreign capital for some time has closely regarded this market for the expediency of local production to supply partially the domestic consumption of approximately 800,000 tires per annum. Peculiar local conditions have so far prevented the advisibility of such a step. Michelin, however, has recently investigated the situation and it is reported from reliable sources that in the very near future the French concern will in all probability manufacture tires in the Argentine.

The Peruvian Government has granted the exclusive rights to three native citizens to manufacture tires for a period of ten years. The concessionaires, however, aim to consign their rights for a consideration or to receive a percentage of profits of a branch factory subsequently established locally by a foreign manufacturer. The Peruvian local consumption of tires is estimated around 32,000 annually.

It is reported in the German press that a factory has been established in Marienberg, West Prussia, near the Danzig frontier, under the name of Deutsche Gummiwerke Pepege A. G. with a capital of 1,000,000 marks. The shares of this company are said to be in German and Swiss hands. The factory will be engaged in the manufacture of rubber shoes.

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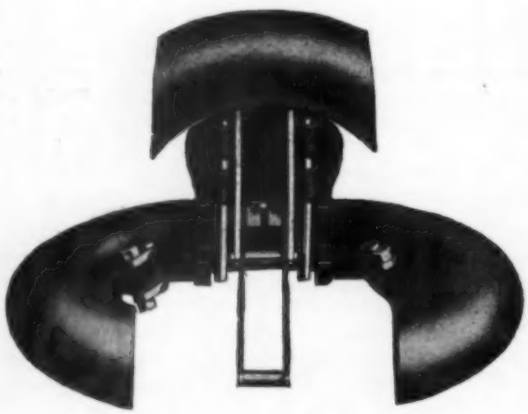

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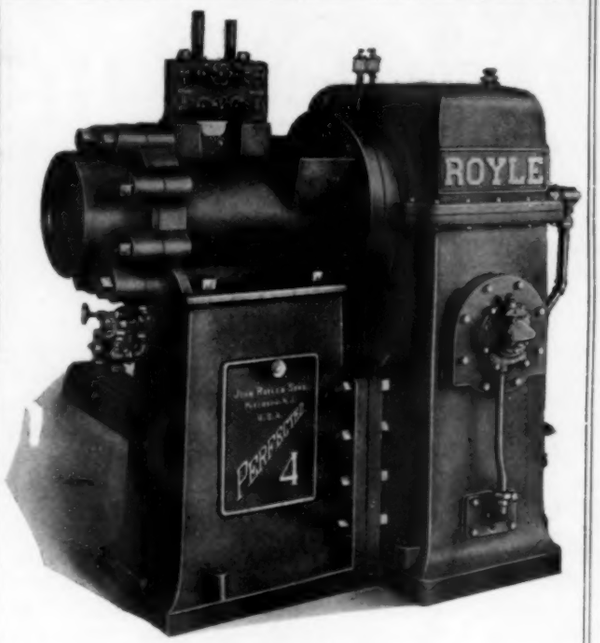

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EDITORIAL COMMENT

Exploding an Old Apothegm

FOOTWEAR executives of the older generation have always subscribed to the theory that one good snowstorm before Christmas was worth a dozen thereafter, as far as establishing rubber shoe demand went. In this respect December, 1928, was unkind except in a few isolated districts, as was its predecessor of 1927. Yet all the while modern conditions have been changing the trend in this direction, and there are many of the newer generation who believe, with some apparent logic, that even if December, 1929, should usher in a good old-fashioned winter of extreme severity, the sudden acceleration of demand would not have its old time vigor.

The modern snowplow, the tractor, increased automobile transportation and the highly efficient municipal street cleaning methods have changed underfoot conditions particularly in the large centers of population. The efficiency of snow removal has been advanced to a marked degree which has had its effect on the demand for waterproof footwear.

To some this may seem to indicate that the rubber footwear industry is facing a declining demand for its products. Not at all. On the contrary, despite unfavorable weather conditions, the demand is increasing in two very important fields. First, the new elements of style, color, and fit, which have been developed in women's wear have widened the market of the old-fashioned galosh; secondly, the demand for canvas shoes for sportswear is rapidly increasing with the countrywide development of physical education for all classes. Aside from these two growing fields, there is the industrial business from mines, refineries, creameries, and construction work of all kinds.

This does not mean to decry the benefit of the old-fashioned snowstorm to the industry, but rather to point out that the volume of rubber footwear is becoming less dependent on the fickle whims of the weather man, and is rapidly encroaching upon fields where the sowing and reaping is controlled by good product and progressive merchandising.

BB Contracts

THE striking thing in connection with the activities of the New York Rubber Exchange, and a point which naturally comes up at this time when the Exchange is celebrating its third anniversary, is the apparent collapse in floor trading in BB Contracts. When this contract was approved by the Exchange members the move was applauded as a distinctly forward step in view of the large tonnage of crude rubber in the BB grades which is annually consumed by the American manufacturers. It seems extraordinary that after many months of listing quotations that only 40 lots have been actually traded in and it is understood that all of this amount was handled by only one firm.

There may be something in the explanation that BB grades have heretofore called for spot transactions but the point that was raised at the time they were listed on the Exchange was that with the Exchange facilities for "hedging," etc., it would have been advantageous for members to deal in BB futures.

Possibilities Loom in Airplane Tires

MORE and more is it becoming apparent that the activities in aviation hold great promise for the tire manufacturer. It can be recalled within the memory of most of us that the automobile industry in its early days offered little prospect for the tremendous production of today and the resultant huge consumption of rubber tires.

Today only about five of the larger tire manufacturers are making any farsighted plans for serving the aviation industry of the future. And what a future it portends to be.

Other manufacturers may well study the possibilities here. Already many of the automobile equipment and accessory companies are looking at the matter seriously and with bright countenances.

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Editor.....P. L. Palmerton
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SHORT NEWS & DEPARTMENTS

Names in the News
Rubber Goods & Specialties
Foreign Rubber News
Crude Rubber Items

SWINEHART CO. PURCHASES ERIE RUBBER CORPORATION

The purchase of the business and part of the equipment of the Erie Rubber Corporation, Sandusky, O., was announced February 18 by officials of the Swinehart Tire & Rubber Company of Akron. The Swinehart organization acquires the business, patents and plans of the Sandusky firm, and J. A. Miller, president and general manager of the Erie Company, will join the sales force of Swinehart in charge of the sale of Erie products, which will be made under that name in the Swinehart plant at Akron.

Operation of the Sandusky factory has been discontinued, and a large portion of the equipment of that plant is being moved to Akron so that manufacture of the Erie line of products can be started as soon as possible. "The purchase will enable Swinehart to materially increase its production without a proportionate increase in overhead expenses," says C. O. Baughman, secretary and treasurer of the Akron company, "and it is anticipated that it will be very beneficial to our organization."

Rumors of the sale of the Erie Rubber Corporation were prevalent last month, but officials of the company remained non-commital at the time. The company had been under the control of wealthy eastern men who were creditors of the old Erie Tire & Rubber Company. During the past month the factory was working with only 35 employees as against a force of 200 persons who were employed last summer.

The products of the company included "Erie Gold Seal" cord and balloon tires, "Erie Red Seal" cord tires, "Erie" tubes, and special brand tires and tubes.

SUN RUBBER COMPANY TO CREATE NEW DEPARTMENT

Expansion of the sales and production departments of the Sun Rubber Company, Barberton, O., for the manufacture of special design moulded rubber goods has been announced by company officials. William German, for 14 years associated with the Goodyear Tire & Rubber Company, has joined the Sun organization and will have charge of the new department created to consolidate and develop these activities.

Mr. German joined the Goodyear staff in 1914 after a short period spent in steel engineering at Pittsburgh. He first worked as a mechanical goods salesman at the Pittsburgh branch, coming to Akron in 1916 to head the sheet packing sales department. Later he was promoted to manager of moulded and lathe cut parts, which position he held until he resigned to join the Sun Rubber Company.

Rubber Keeps Jockey Slim

A jockey must guard against any increase in weight if he wishes to remain in the saddle, and Jack Leach, the English jockey, goes through daily exercises while wearing this special rubber weight reducing suit. Its effect is to quicken perspiration and to draw tightly about his body so as to prevent any tendency to put on weight.

BOSTON WOVEN HOSE BUYS ADJOINING STRUCTURES

The Boston Woven Hose & Rubber Company, Cambridge, Mass., has enlarged its manufacturing facilities by the purchase of three three-story buildings containing 63,000 square feet of manufacturing space, together with a power plant and 76,741 square feet of land. The property adjoins its present buildings and is bounded by Broadway, Hampshire Street, the Boston & Albany Railroad and Broad Canal.

The company is increasing production and reports a steadily increasing demand on all its lines.

GROUND IS BROKEN FOR NEW GOODYEAR FACTORY

Clifford Slusser, vice-president and factory manager of the Goodyear Tire & Rubber Company, turned over the first shovelful of earth on the site of the new plant of the company at Gadsden, Ala., on February 7. Work on the construction of the $5,000,000 plant is now under way, and the first three buildings are to be finished by May 1, June 1 and July 1, respectively.

Simple ceremonies attended the breaking of ground for the new southern factory, the others to wield the shovel being Judge O. R. Hood, chairman of the industrial committee of the Gadsden Chamber of Commerce; Louis Loveman, president of the Gadsden Chamber of Commerce; William Weir, mayor of Gadsden; and Otto Agricolo, president of a Gadsden bank. The general contract for the construction of the factory was awarded to the Adams Construction Company, Atlanta, Ga., which will build all but the power plant. The contract for the steel structure was awarded to the McClintic-Marshall Company, Pittsburgh, Pa.

Gadsden is at present in the midst of the greatest boom in its history. Hundreds of contractors are in the town, hoping to obtain some of the work in erecting the 475 houses that will be built, and hotels are so crowded that guests are sleeping in cots in the hallways. Real estate is booming, and calliopes travel the streets with huge signs, "Grow with Goodyear."

Production at the new plant is scheduled to start July 1 with an initial capacity of 5,000 tires a day. The Clearwater Mills at Cedartown, Ga., will be enlarged from its present capacity of 32,000 spindles to 50,800 spindles in order to supply ample tire fabric for the new factory.

EMPLOYMENT SHOWS GAIN IN OHIO RUBBER PLANTS

In an advance bulletin covering employment in the rubber products industry of Ohio, including tire and tube factories, issued by the Bureau of Business Research of Ohio State University, it is shown that January employment was 3 per cent greater than that of December and 6 per cent greater than that of January, 1928. Of the 29 reporting concerns, 18 showed increases in January employment, 9 showed decreases, and 2 showed no change.

FRANK GABLE, tire engineer, and DAN KIMBALL, western district manager of the General Tire & Rubber Company, spoke before a meeting of 100 company representatives and distributors at a meeting in the Hotel Senator, Sacramento, Cal., on January 14.

SERVICE MANAGERS GROUP PLANS EXTENSIVE PROGRAM

A meeting of the Service Managers Committee—Tire Manufacturers Division—of the Rubber Association was held at the Park Central Hotel in New York, January 24th and 25th. The meeting was well attended, representatives of ten companies being present, and a number of matters of interest were discussed during the two-day session.

It was announced that the directors of the Rubber Association had appropriated sufficient funds to defray the cost of printing and distributing tire educational booklets and posters during the year 1929. The Association's booklets "Tire Care," "The Care of Tires for Trucks and Busses," and the poster, "Inflation Pressure Chart for 1929 Model Cars" will be revised and reissued. As in previous years, the Association will arrange with car manufacturers for the distribution of the booklets to purchasers of new cars, trucks and busses. The poster is distributed to gas-filling stations and garages throughout the country. Tire dealers are expected to secure their supplies of the booklets and poster from the manufacturers whom they represent. The pamphlet "The Care of Pneumatic Tires" will be discontinued.

B. W. Huling of The B. F. Goodrich Company was elected Chairman of the Committee, and G. A. Wiedemer of the Seiberling Rubber Company was elected Vice-Chairman for the current year.

Columbus Receiver is Named

William C. Willard was appointed receiver for the Columbus Tire & Rubber Company, Columbus, O., by Judge Dana F. Reynolds on February 11. The company was incorporated in 1920 with a capital of $150,000 preferred stock and 2,000 shares of no-par common, and has manufactured 100,000 casings of all types annually under the brand name of "Columbus Red Seal."

Grant Lambright

Grant Lambright, superintendent of the Durkee-Atwood Rubber Company, Red Wing, Minn., died January 30 at his home in that city. His body was brought to Akron for burial.

Coming to Akron at the age of 16, Mr. Lambright started his career with the B. F. Goodrich Company and was later manager of the former India Rubber Company in that city. He was also associated with various rubber companies in Marion and Bucyrus, O., and Seattle, Wash. He was 56 years old at the time of his death.

Goodyear Group Dinner

The annual dinner of the aeronautical department of the Goodyear Tire & Rubber Company was held at Young's Hotel, Portage Lakes, O., on the evening of January 16 with 80 members of the department present. Lieutenant George Whittle of the United States Navy was a guest at the dinner and spoke briefly. Other speakers included C. N. Braden, division superintendent; Elmer Clark, plant superintendent; W. C. Young, aeronautical head; J. A. Butler, and Dr. Karl Arnstein.

Manhattan Plans to Build

The Manhattan Rubber Manufacturing Company, Passaic, N. J., is planning the erection of a two-story brick addition to its present plant for manufacturing purposes. The company is also planning to build a steel structure for storage purposes and a steel garage in which to keep its fleet of automobiles and trucks. Plans for the erection of these buildings have been filed and the necessary permits granted.

G. D. KRATZ, chairman of the board of directors of the Falls Rubber Company, Cuyahoga Falls, O., was named as sole legatee to the estate of his mother, who died January 31. Mrs. Kratz was the widow of the late GEORGE KRATZ, one of Akron's first furniture dealers.

Ajax Orders on Increase

H. W. Roland, general sales manager of the Ajax Rubber Company, Racine, Wis., reports that orders received from dealers in December, 1928, showed a 51 per cent increase over those of December, 1927, and a 37 per cent gain over those of November, 1928.

New General Dividend

Following closely upon the declaration of an extra Christmas dividend of 8 per cent, the General Tire & Rubber Company has just declared a regular quarterly dividend of 4 per cent on its common stock of $25 par value. The new dividend, which was to be paid February 1 to stockholders of record as of January 21, is the first on which there has been an increase of from 3 to 4 per cent.

California Goodyear Gains

Sales of the Goodyear Tire & Rubber Company of California totaled $26,109,252 during 1928 as against $23,590,315 for the year previous. After taxes, charges, depreciation and reserve, however, the net profits amounted to only $1,882,966 as compared with $2,103,432 for 1927. There was a marked gain in unit sales that is not reflected in the total sales volume owing to price reductions.

Du Pont Common on $4 Basis

E. I. du Pont de Nemours & Company have declared an initial quarterly dividend of $1 on the new $20 par common shares, placing the stock on a $4 annual basis. This is equivalent to $14 on the old no-par stock, recently split 3½ for one, which was on a $10 regular annual basis.

Rubber Stock Issues Recede

Stock issues of the various rubber manufacturing companies receded in the general bear market that has followed the recent action of the Federal Reserve Board. During the past fortnight, 15 common and preferred stock issues of leading rubber companies touched new low levels for the current year. Rubber stocks, however, have not been among the most actively selling issues on the different exchanges, indicating that many investors are holding on to their shares in expectation of an upturn.

Fisk Heads Entertain Royalty

TRAVELING incognito as "Mr. Cyril Sokolski," Prince Cyril, brother of King Boris of Bulgaria, made the plant of the Fisk Rubber Company, Chicopee Falls, Mass., one of his first stops on an inspection tour of American industrial conditions. In the picture, from left to right, are Frank K. Espenhain, executive vice-president of the Fisk Rubber Company; Prince Cyril; H. T. Dunn, president of Fisk; and Dr. Max Rabes of the University of Erlanger, Bavaria, who is traveling with Prince Cyril. The prince is the second son of the late King Ferdinand.

Late Stock Prices

	Last Price Feb. 4	High —1929—	Low —1929—
Ajax	9⅛	10⅜	11¼	9
Falls	8	8½	11⅜	5
Faultless	36¼	38	39⅞	33
Firestone	225	240	250	220¼
do. 6% pfd.	108¼	111	111	108¼
Fisk	16½	17¾	20⅛	15⅝
do. 1st. pfd.	—	78½	82½	68½
General	251	—	282	251
do. pfd.	101	101	102	99½
Goodrich	91	97	105⅝	87⅛
do. pfd.	114⅝	114⅜	115	113
Goodyear Com.	122	129¼	140¼	116
do. pr. pfd.	103	102½	103⅞	102
Hood	23	25	27¼	21
India	65	67⅛	73	39
Intercontinental	12	11¼	14¼	10¾
Kelly Springfield	18⅜	21¼	24	18
do. 1st pfd.	95⅛	97⅞	100	95⅛
Lee	19⅛	22½	25	19⅛
Miller	22½	24⅞	28¾	22½
do. pfd.	80	82	83	75
Mohawk	57	59½	66	57
do. pfd.	80	85	90½	81
Norwalk	5½	6	6¾	5
Seiberling	52	58⅜	65	52
do. pfd.	107	107½	107⅞	105¼
U. S. Rubber	48⅛	50¼	55¼	42
do. pfd.	81	87½	92½	77

Names in the News

ROBERT J. STOKES, president of the Thermoid Rubber Company, has been elected a director of the Broad Street National Bank, Trenton, N. J.

L. R. JACKSON, general sales manager of the Firestone Tire & Rubber Company, presided at a meeting of more than a hundred Firestone tire dealers, salesmen and branch managers at the Hotel Statler, Buffalo, N. Y., last month. C. M. O'HEARN, divisional sales manager, and other company representatives also addressed the conference, which is one of a series of meetings being held at pivotal points in the Firestone distributing organization.

JESS A. SHIVELY was awarded a patent for an attachment for calenders and NIGEL G. BRUCE a patent for a packing ring during the past month. Both patents were assigned to the Goodyear Tire & Rubber Company.

H. STUART HOTCHKISS, president of the United States Rubber Plantations, Inc., has arrived in the Far East for a visit to the company's plantations in Sumatra and Malaya. He left New York on January 4.

W. F. EARLS has been appointed general manager of advertising for the United States Rubber Company. All advertising and publicity activities of the organization have been consolidated into a single advertising department under his direction.

HARVEY S. FIRESTONE has been named a member of the Ohio Waterways Commission by GOVERNOR MYERS Y. COOPER. He is one of seven members who will serve on this board.

JOHN M. YOLTON, former member of the areonautical sales department of the Goodyear Tire & Rubber Company, has returned to the organization as assistant foreman in the Goodyear-Zeppelin plant. He first joined Goodyear in 1912 as a test car driver and later, entering the areonautical division, supervised the construction of the *Pilgrim* and made several flights in this airship. In December, 1927, he resigned to go into the retail tire business in Texas and after that came back to Akron and leased the Homer Hotel.

DR. CAIO LUIS PEREIRA DE SOUSA, eldest son of the president of Brazil, made a tour of inspection of the Akron factories of the Goodyear Tire & Rubber Company last month. Dr. de Sousa, who is only 23 years old, is president of the largest steel works in his country.

SYLVAN E. WEIL has been elected a member of the New York Stock Exchange, giving the firm of H. Hentz & Company two representatives on the exchange . Mr. Weil, who was manager of the rubber department of the firm and was admitted to partnership last year, paid $615,000 for his exchange seat. He is also a member of the Rubber Exchange of New York and of the National Raw Silk Exchange.

PAUL A. POLSON, of the Polson Rubber Company, Garrettsville, O., is continuing his business tour of the Pacific coast states. He will return to the factory before the end of the month.

EDWARD BARRY, chief engineer of the Pacific Goodrich Rubber Company, was a speaker at the regular luncheon meeting of the Optimist Club, San Pedro, Cal., on January 23. He traced the history of rubber through history and told how the daily life of the public is affected by the rubber trade.

ALLEN MACCRACKEN, mechanical engineer of the Goodyear Tire & Rubber Company, made his first solo flight as a student balloonist recently. He took a free balloon from Ravenna to Hiram, O., at which point he was relieved by JAMES STALEY, another Goodyear student, who made his first solo flight from there to the town of Welchfield.

T. F. KUCKLEMAN of the Miller Rubber Company, spoke before the Kiwanis Club f Marysville, O., last month, tracing the development of the present day super tire with almost limitless mileage.

LYNN HARVEY, manager of tire sales for the Dayton Rubber Manufacturing Company, Dayton, O., has returned from a two-month tour of the middle west and Pacific coast regions. He reports having found a widespread popular demand for the products of his company.

L. G. FAIRBANK, truck and bus tire manager of the Firestone Tire & Rubber Company, was in charge of a series of meetings of the salesmen of his division, held at the Akron factory during the week ending February 1. About 80 sales representatives heard reports on the new products and policies of the organization.

P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, is the candidate of the Akron Chamber of Commerce for the position of director of the Chamber of Commerce of the United States from the district which includes Ohio, Indiana, Michigan and Kentucky. Akron has not been represented on the board of national chamber since F. A. SEIBERLING retired as a director 14 years ago.

P. A. GRASSELLI II, son of THOMAS S. GRASSELLI, president of the Grasselli Chemical Company, has been elected to serve on the board of directors of the organization. His is the fourth generation of the family to hold a place on the board.

D. L. MCMATH has been appointed local factory representative of the Firestone Tire & Rubber Company at San Diego, Cal., succeeding R. L. MCLEOD, who is now in charge of truck and bus tire sales for the Los Angeles territory. Mr. McMath has been in the rubber industry for the past 15 years and has been associated with the Firestone company since 1920.

WILLIAM C. YOUNG, head of the aeronautical department of the Goodyear Tire & Rubber Company, addressed the members of the Cleveland-Hiram Alumni Club at their monthly luncheon meeting on February 7. He predicted that travel by air will in time become the most popular means of transportation.

F. A. SEIBERLING, president of the Seiberling Rubber Company, left Akron on February 5 for a brief business trip to New York, after which he headed for Miami, Fla., for a winter vacation.

B. F. FULTON, manager of the Akron airport, spoke before the members of the Knights of Columbus at their luncheon held at the Akron Elks Club on February 8. He predicted that, with the plant of the Goodyear-Zeppelin Corporation as a start, Akron should become the centre of the world's aviation industry with a population of 1,000,000 by 1940.

J. J. SHEA, treasurer, and W. T. LEWIS, director of purchases for the Firestone Tire & Rubber Company, have been touring southern California on a combined business and pleasure trip. Mr. Shea declared in newspaper interviews that he looked forward to Los Angeles becoming more and more a place for branch factories of eastern companies.

W. E. ASHBY of the Goodyear Tire & Rubber Company has been announced as the winner of the first award of $250 in the special suggestion contest conducted by the company for the year 1928. His suggestion originally won him a check for $500. Other prize winners were P. O. HEISLER, H. M. HOOPER and L. GRAHAM.

E. D. EDDY, president of the advertising agency of Eddy & Clark, Inc., Akron, O., has retired from the business and sold his interest to his associates. Mr. Eddy was associated with the Goodyear Tire & Rubber Company for six years before entering the agency field.

F. E. TITUS, general sales manager, and other officials of the Pacific Goodrich Rubber Company, returned to Los Angeles February 15 after a fifteen-day trip over the company's sales territory during which sales conferences were held at Seattle, Spokane, Salt Lake City, Denver and Phoenix. The party included James S. Smith, pneumatic tire sales manager; J. L. Kelly, branch administration manager; and E. T. Morris, advertising manager.

Rubber News Around the World

ERIC MILLER DECLARES CONFIDENCE IN FUTURE

Chairman of Harrisons & Crosfield Expresses Belief That Prices Must Show Rise If Production Is to Meet Increased Absorption.

In a comprehensive review of the rubber situation for a London newspaper, H. Eric Miller, chairman of Harrisons & Crosfield, prominent English rubber firm, describes 1928 as an eventful year for the industry and predicts that production can not meet increased demands except at substantially higher prices. In summing up the effects of restriction, he finds that "estates subject to the Stevenson Act are agriculturally much improved and British companies generally are in a sounder condition than they were six years ago."

The fundamental factors of supply and demand, he states, are that six years must elapse before a rubber plant will give its first commercial crop and five more years before it will give its maximum yield and, secondly, that 80 per cent of all rubber goes into automobile tires and tubes. "Producers of rubber," he declares, "have had to face the effect of many far-reaching improvements in the manufacture of tires, whereby each pound of rubber was made to give an increased mileage, and also the general improvement of roads has had a similar effect. All this has necessarily tended to curtail the demand for crude rubber from time to time and to retard for a longer or shorter period the normal increase in absorption.

"About one-third of the annual output of rubber comes at present from hundreds of thousands of small native holders in Malaya and the Netherlands East Indies, and the remainder, although predominately British, is owned by producers of half a dozen nationalities. Therein lies the difficulty of making effective any scheme based on purely voluntary adherence to regulate, according to needs, a sufficiently large proportion of the output.

H. ERIC MILLER

"When the present accumulations of the East are distributed throughout the world, as is rapidly occurring, it will be realized more clearly that there are really no excessive surplus stocks in existence, and that the present stocks are no more than necessary for the normal working of the industry. This means that for the next few years production will have to cover not only absorption, but also increase in the necessary working stocks which the increase in absorption will entail. Taking a broad view of the industry, it does not seem possible that production can be sufficient to meet these demands except at a substantially higher price than that now prevailing."

RACING CAR'S SPEED IS LIMITED BY ITS TIRES

Major H. O. D. Segrave, British automobile racing car driver, is now at Daytona Beach, Fla., preparing for his attempt to break the world's record of 207.55 miles an hour, established by Ray Keech last year. His new Irving special, known as the "Golden Arrow" because of its unique streamline design, has a theoretical speed of 240 miles an hour and is limited only by the ability of its tires to stand up under the gruelling test.

One of the biggest problems encountered in building the car was the design of the wheels and tires, and they have together cost nearly as much as the whole of the rest of the car. Approximately £16,000 was the cost of wheels and tires, while the remainder of the car was built at an expense of about £18,000. It has been calculated that the tires will serve for only 25 seconds at full speed, but only 15 seconds at that rate would be necessary to set up a new mark for the mile. Major Segrave believes that, unless a substitute can be found for pneumatic tubes, the speed limit of cars has been reached.

On every trip a complete change of tires must be made. The car is also fitted with rubber upholstery and other accessories.

Australian Merger Completed

The stockholders of the Barnet Glass Rubber Company at a meeting in Melbourne January 23 unanimously approved the terms offered by the Dunlop Rubber Company of Australia for the purchase of the whole of their company's ordinary stock at about $8 a share. The Barnet Glass Rubber Company, one of the largest and oldest rubber firms in Australia, is the second concern to be acquired by Dunlop within ten months. Last April the Perdriau Rubber Company was merged with the Dunlop organization.

H. HARVEY FROST, director of Harvey Frost, Ltd., left London recently for Cape Town to make a two-month business tour of South Africa. Mr. Frost is well known for his pioneer work in connection with vulcanizing tires.

Rubber Man's Home for King George

FOR his recuperation after his recent illness, King George has been removed to Craigwell House, the Bognor residence of Sir Arthur Du Cros, president of the Dunlop Rubber Company, Ltd. The King arrived on February 9 after extensive preparations had been made for his reception. Silverston Cottage, which is on the grounds of Craigwell House, has also been placed at the disposal of the King and is being reserved for the visits of the Prince of Wales, Princess Mary, and other members of the royal family. In the view of Craigwell House above, the beach can be seen in the left foreground.

CATALPO
for
Treads

Rubber Goods and Specialties

Autocrat Universal Balloon

By making the new Autocrat Universal balloon tire so that it takes the place of a regular size and an oversize casing, the McClaren Rubber Company, Charlotte, N. C., has cut down its 51 sizes to 28, thus reducing their dealers' inventory in sizes by 45 per cent. The new balloons have been developed as a result of continuous research and experiment in the McClaren laboratories and factories and are guaranteed for life against all road hazards, including cuts, blowouts, bruises, wheels out of alignment, under inflation and accidents.

New Dunlop Jack

A hydraulic jack that will lift a four-ton car by moving a handle is now included in the British Dunlop Rubber Company's range of jacks. It has only one operating point, can be worked without steadying, and has an adjustable extension to provide for the various axle heights of different makes of cars. No effort is required to raise a dead load of one ton, as the handle merely has to be moved up and down until the desired height is obtained.

New Seiberling Tire

A new "super" tire under the name of the Seiberling Special Service has been introduced by the Seiberling Rubber Company, Akron, O. The newly developed rubber compound of which the tread is made has been given the name Affinite, because of the

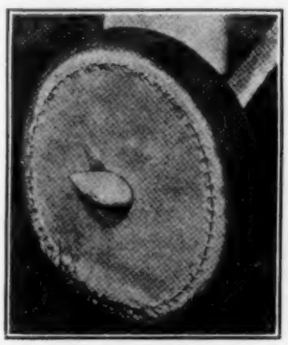
close affinity which is established between the rubber molecules. According to the manufacturers, exhaustive tests, in which sections of tread stock were held against a friction wheel under even pressure and tension, showed that the new Affinite tread wore down 35 per cent less rapidly than the best stock they had used before. Despite this increased resistance to wear, there is said to be no sacrifice to elasticity.

Rubber Pretzel

A sponge rubber pretzel, which is the same size as a real pretzel and looks exactly like the real thing, is the latest novelty announced by the Seiberling Latex Products Company, Akron, O. It is designed for the purpose of a harmless practical joke at card parties, banquets, conventions and similar occasions. Dealers in novelties are already said to be enthusiastic about this new item, and the company expects a wide acceptance throughout the country.

Streamline Wind Shield

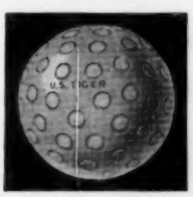
Made of rubberized fabric, grommeted and laced to a vulcanized skirt on the tire, these Goodrich Streamline Wind Shields take the place of metal discs on airplane wheels. According to the manufacturer, the B. F. Goodrich Company, Akron, O., the reduction of weight in these wind shields as against metal discs is from six to eight pounds per wheel. In wind resistance, it is



figured that on two 30x5 tires carried at a speed of 100 miles an hour these shields save approximately 3¼ horsepower. Hence, it is claimed that their use will increase the speed of airplanes and lengthen their flying radii.

New Golf Ball

Following a long period of experimentation in the development of a radically new marking and cover construction, the United States Rubber Company, 179 Broadway, New York City, is introducing its "U. S." Tiger golf ball to the sporting world. The marking is said to be the first radical change in golf ball design in many years. The cover has fewer indentations than any other markings now in vogue, a feature which tends to give the ball long flight. Thus it is smoother and consequently slides through the air with less resistance, although there are sufficient indentations on the cover of the ball to properly brace it and hold it true in flight. According to the manufacturer, "U. S." Tiger balls that have been played by average golfers over 300 holes have not shown even the slightest tendency to cut through the cover.



Goodrich Cavalier Tire

As a companion to its Silvertown line, the B. F. Goodrich Company, Akron, O., is now producing a new standard tire of high quality in material and workmanship, occupying, according to company officials, a place in the tire field similar to lower priced high grade cars in the automobile field. The Goodrich Cavalier tire, as it is known, is being offered to furnish dependable and economic transportation as a standard tire for motorists who want tires to bridge the gap between the remaining life of an old car and a new one. Road and laboratory tests are said to show that the new casing has high wearing qualities.

Christmas Tree Balls

As a part of its extensive line of rubber novelties, the Rex Rubber and Novelty Company, 96 Warren Street, New York City, is now offering ornamental balls for Christmas trees to replace the usual tinsel decorations. Though made of rubber, covered by netting, they look exactly like the familiar fragile balls of tinsel.

New U. S. Royal Tire

As its addition to the continually growing list of "super" tires, the United States Rubber Company, 1790 Broadway, New York City, have announced a new casing to be known as the U. S. Royal Extra Heavy. This casing is built to meet the unusual demands placed upon tires by present day conditions in motoring, according to the company announcement. It is sturdier in construction than the regular Royal, is longer wearing, and has greater safety due to its tread design. It is also said to steer easier and ride easier and to make a finer appearance than other casings which the company has heretofore manufactured.

Current Crude Rubber Items

LONDON AND LIVERPOOL VIE AS RUBBER MARKETS

Since the middle of November the Rubber Trade Association of London has issued from its offices Liverpool's weekly rubber-stock figures. The significance of this appeared at the end of the year, when the last week in December saw Liverpool stocks jump with an increase amounting to approximately 50 per cent more than the total landings for the preceding six weeks.

The strict regulations of the Rubber Trade Association state that rubber may only enter warehouses in Britain mentioned by the R. T. A. for rubber storage, and only samples from such warehouses are recognized. Liverpool has modern warehouses which satisfy the R. T. A. standards, and has recently increased its accommodation for rubber, and may still do so.

The trade designates each storage as "recognized wharves," and in Liverpool it has been found possible to store rubber at slightly cheaper rates than obtain in the Port of London. Liverpool also is within nearer railroad distance of the big British rubber producing centers in the north and midlands.

Nothing has been heard so far of a similar move in Manchester, but a London authority states that it is quite possible that Manchester may soon claim "recognized wharves" suitable to the requirements of the Rubber Trade Association.

AGREEMENT OF PRODUCERS IS CALLED "IMPOSSIBLE"

An international rubber producers' agreement is impossible, M. Swart, president of the International Rubber Producers' Association, recently told the Hague representative of the Agence Economique. Mr. Swart, a Hollander, who presided at the last conference in London which failed to bring an international producers' agreement, holds the abolition of Stevenson's plan by the British government to be regrettable from the Dutch point of view, but a fortunate measure for international interests.

He predicts an advance of rubber which will be followed by a drop, so that fluctuations during the next two years or more are inevitable. Stabilization of the commodity being highly important, British and Dutch producers are seeking a direct agreement with American consumers, he says. He believes the latter might be willing to pay higher prices than present for rubber so as to assure a margin of profit to the producers, but chiefly to obtain stability of quotations and to avoid fluctuations which are harmful to the industry.

RUBBER COMPANIES' PROFIT REDUCED DESPITE MERGER

The first profit statement to be issued by the United Serdang (Sumatra) Rubber Plantations, Ltd., since it absorbed the Amalgamated (Rubber) Development Co. is that for the year ended August 31 last, and shows net profits of £163,546 ($817,730). Since the amalgamation was effective as from December 1, 1927, the sum includes nine months' figures of the two companies taken over. Net profits of the United Serdang alone for 1926-27 amounted to £183,185.

The fact that a decrease, instead of an increase, is shown, in spite of the inclusion for three-quarters of the year of the earnings of two other companies, is due to the fall in the price of rubber last year. The company is paying a dividend of 10 per cent on the old shares which compares with 22½ per cent for 1926-27 and 40 per cent for 1925-26.

£20,000 is carried to reserve, which a year ago received nothing, and the sum carried forward, which a year ago was increased from £1,483 to £66,594, is now raised further to £83,776. Holders of the new shares issued to share and debenture holders of the Amalgamated companies receive three-quarters of the dividend on the older shares.

Exchange Seat Is Sold

The membership of William J. Jung on the Rubber Exchange of New York, Inc., has been sold to Charles T. Moore (for another) for $10,000, the price being unchanged from the last previous sale.

PRICES RISE HIGHER ON RUBBER EXCHANGE

Spot Quotations Pass 25-Cent Level With Future Positions Up to 130 Points Higher as Active Trading Causes Heavy Buying Movement.

CRUDE rubber prices shot upward nearly three cents a pound in the course of several excited sessions on the Rubber Exchange of New York, Inc., during the past fortnight as the trade and the speculative element joined hands in an unrestrained buying movement. Spot quotations, which were at 22 cents on February 7, reached a peak of 25.30 cents on February 18, the highest level recorded since the early part of last April. Future deliveries ranged all the way up to 26.60 cents for January, 1929.

The fact that domestic consumption during the usually slack month of January had risen to 43,002 long tons was a factor in the rise, as well as the report that American tire manufacturers had bought all the available offerings of actual rubber in the trade and that they were extending their buying in the foreign markets. London prices rose above a shilling a pound for the first time since restriction was abandoned.

Declines Abroad Disregarded

Even setbacks in the foreign market failed to dampen the enthusiasm of bullish traders until the final day of the period, when this element was not quite so successful in sustaining the market against the adverse influence of declines abroad. Prices, however, closed only with slight losses, the final quotations ranging from unchanged to 40 points below those of the previous day.

The session of February 15 was of close to record breaking proportions, transactions during the day totaling 3,762 contracts, or 9,405 long tons. Following days brought higher prices, but no such avalanche of trading activity.

The table below indicates the daily fluctuations in prices on the Exchange and the daily volume of sales.

Closing Prices on Rubber Exchange of New York, Inc.

FROM FEBRUARY 5 TO FEBRUARY 19, 1929

		Spot	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan	Sales*
Feb.	5	22.30	22.10	22.20	22.50	22.70	22.80	23.00	23.10	23.10	23.20	23.30	23.40	23.50	610
	6	22.10	21.90	22.00	22.20	22.40	22.60	22.80	22.90	22.90	23.10	23.20	23.30	23.40	432
	7	22.00	21.80	21.90	22.10	22.30	22.50	22.60	22.80	23.00	23.00	23.10	23.20	23.30	461
	8	21.90	21.80	21.90	22.10	22.30	22.50	22.60	22.80	22.90	22.90	23.00	23.00	23.10	567
	9	22.10	21.90	21.90	22.20	*22.40	22.60	22.80	22.90	23.00	23.10	23.20	23.30	23.40	99
	11	22.00	21.80	22.00	22.30	22.50	22.70	22.80	22.90	23.00	23.10	23.20	23.30	23.40	257
	13	22.70	22.50	22.70	23.00	23.30	23.40	23.50	23.60	23.70	23.80	23.90	24.00	24.10	1,589
	14	22.90	22.80	22.90	23.10	23.30	23.40	23.50	23.70	23.80	23.90	24.00	24.10	24.20	1,149
	15	25.20	25.20	25.20	25.40	25.60	25.70	25.70	25.80	25.90	26.00	26.00	26.20	26.30	3,762
	16	25.00	25.00	25.00	25.30	25.60	25.70	25.80	25.90	25.90	26.00	26.10	26.10	26.30	1,223
	18	25.30	25.20	25.30	25.50	25.60	25.80	26.00	26.10	26.20	26.40	26.50	26.50	26.60	2,162
	19	25.00	25.00	25.00	25.30	25.60	25.70	25.70	25.80	25.90	26.00	26.10	26.30	26.30	787

In lots of 2½ tons each

CATALPO
for
Inner Tubes

PACIFIC GOODRICH MEN HAVE SALES CONFERENCE

Local officials and salesmen of the Pacific Goodrich Rubber Company, conducted a sales conference last month at the Hotel Utah, Salt Lake City, Utah. Several speakers declared that in their opinion 1929 will prove a record breaking year for the automobile and rubber industries with more tires made and sold than in any previous year.

The principal speakers were F. E. Titus, general sales manager; Jay S. Smith, manager of the automobile tire department; A. C. Row, advertising manager of the northwestern territory; and J. L. Kelly, manager of branch administration. Mr. Titus stated that the company is to conduct a larger advertising campaign than in any previous year and said that a complete line of the company's products will be placed in stock at the Salt Lake City branch, a new home for which was constructed recently.

New Tire Dealer Service

The Tire Dealers Service Corporation, Akron, O., has been formed to render technical service to tire dealers and jobbers on the products they purchase, to locate sources of supply, to set up specifications for special brand products, and to inspect the raw materials as well as the finished product for clients. According to M. J. Miscoe, president and general manager, the organization will bring together reputable dealers for the purpose of increased volume buying at lower costs. Development work on new materials and methods is also carried on under the supervision of Mr. Miscoe, who has been connected with the industry since 1908.

New General Tire Office

The General Tire & Rubber Company has leased the 21st floor of the building at 1776 Broadway, New York City, through Cushman & Wakefield, Inc. This will be used in the future as the company's eastern division executive offices.

CATALPO

for

Flexing

Re-elect Oak Officers

Officers of the Oak Rubber Company, Ravenna, O., manufacturers of toy balloons and novelties, were re-elected to their positions at the annual business meeting of the company February 7. John W. Shira was again named president and general manager, with P. L. Frank as vice-president and Paul Collette as secretary and treasurer.

Northern Officers Elected

L. J. Schott was re-elected president of the board of directors of the Northern Rubber Company, Barberton, O., manufacturers of tires and tubes, following the annual meeting of the stockholders and directors on February 9. Other officers are Edmund Shaw, treasurer; H. H. Milton, assistant treasurer; and E. M. Hahn, secretary, the latter succeeding Owen Moynihan. Directors include F. M. Howard, Dr. A. A. Kohler, C. Blake McDowell, T. H. Clark, J. I. Bower, F. W. Siffert, J. M. Immler, Mr. Schott and Mr. Shaw. Stockholders were told that the company's business exceeded $1,000,000 during the past year.

No New Goodyear Airport

Officials of the Goodyear-Zeppelin Corporation have denied reports that the company is buying land adjacent to the municipal airport at Baltimore, Md. The report stated that speculation had been aroused regarding establishment of a trans-Atlantic dirigible service. Akron officials, however, declare that the company is buying no land at Baltimore and that, if any land is being purchased, it is by individual members of the firm, which is considered doubtful.

Waste Dealers to Meet

The National Association of Waste Material Dealers, Inc., will hold its annual meeting on the afternoon of March 20 at the Congress Hotel, Chicago, Ill., with its annual banquet in the evening. E. B. Friedlander of the Lowenthal Company, Chicago, and Fred Mayer of the Republic Metal & Rubber Company, St. Louis, have been nominated as directors.

Fisk Starts Sales School

The Fisk Rubber Company, Chicopee Falls, Mass., has organized a sales school to train its salesmen in modern retailing methods and to give them a practical knowledge of the production of Fisk tires. The school involves a two-weeks course, three days of which are for factory inspection, four days for bench experience in the repairing of tires and use of modern repair equipment, four days of sales and advertising study, and one day for examinations.

NEW RUBBER ASSOCIATION TIRE REPAIRING MANUAL

A new and enlarged edition of The Rubber Association's Manual of Tire Repairing, will be ready for distribution about February 15th. The revised text was finally approved at a meeting of the Tire Accessories & Repair Materials Committee of the Association held at the Yale Club in New York, January 9th, and is now being printed.

The first edition of this Manual was issued in 1927, at which time 40,000 copies were printed and distributed. Demands from the trade necessitated a second printing of 20,000 copies later in 1927.

The new edition contains much of the material first included, revised in the light of research and development work by tire repair material manufacturers. Additional matter has also been included, particularly respecting the repair and curing of heavy duty tires and large size balloon tires.

Copies of the Manual will be distributed by the Association, without charge, to more than 25,000 tire repairers throughout the country, who may also obtain free of cost such additional copies as they may need. Tire manufacturers, whether members of the Association or not, and others interested, may obtain supplies of the Manual from The Rubber Association at cost.

RUBBER FOOTWEAR LOSSES ARE SHOWN BY STATISTICS

Figures just published by the Federal Reserve Bank of Boston, Mass., show that volume of shipments of jobbers in that city on rubber footwear was 35 per cent below that of a year ago in December and that the year 1928 showed a decline of 23 per cent. This is largely attributed to the lack of heavy snowfall throughout the country.

State Department of Labor reports for the month of January show that this decline was reflected in manufacturing operations during that period. Employment fell off from 9,005 in December to 8,454 in January, with 7,652 on full time. Average weekly earnings dropped from $26.24 to $23.48, and the employment index fell from 101.3 to 95.1.

New Michelin Warehouse

W. P. Allgor, secretary of the Michelin Tire Company, Milltown, N. J., has announced that the centre of distribution for Michelin tires in western New England and eastern New York will in the future be at Springfield, Mass. A warehouse has been secured at 30 Worthington Street in that city and the buliding has been renovated throughout for the purpose.

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AUTOMOTIVE ENGINEERS REVISE BALLOON SIZES

Two sizes of balloon tires have been eliminated from the list of standard sizes and one size added by the tire and rim division of the standards committee of the Society of Automotive Engineers. This action has been recommended by the division to the standards committee and is to be acted upon by members of the society at the summer meeting, which is to be held next June at Saranac Lake, N. Y.

The sizes it is recommended to eliminate are the 4.75-19, which is not used as original equipment or as an oversize, and the 5.25-18, which is likely to be dropped as original equipment by the manufacturer now using it. A 7.00-19 size has been added to provide an oversize for the 6.50-19 and because it is likely to be adopted as original equipment by one or more makers of large cars.

The list as revised embraces 17 balloon tire sizes for 18, 19, 20 and 21-inch rims, as follows: 4.50-21, 4.75-20, 5.00-20, 5.50-20, 6.00-20, 6.50-20, 7.00-20, 5.00-19, 5.25-19, 5.50-19, 6.00-19, 6.50-19, 7.00-19, 5.50-18, 6.00-18, 6.50-18 and 7.00-18.

Schrader Broadcasts Programs

A. Schrader's Son, Inc., Brooklyn, N. Y., manufacturers of tire valves, gauges and other accessories, have inaugurated a series of Friday night broadcasting programs to be transmitted over the red network of 20 stations of the National Broadcasting Company. The entertainment will include an orchestra and a program by Arthur B. Allen and Louis Mason, theatrical stars, and is being announced to dealers through the mailing of 120,000 copies of an elaborate broadside.

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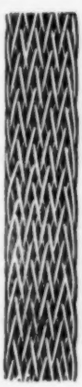

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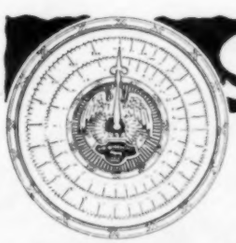

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TESTERS

LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

NEW YORK, FEBRUARY 19, 1929

COTTON

LATE figures of the Rubber Association of America showed that 222,243,398 pounds of cotton fabric went into automobile and other tires during the year of 1928, marking a substantial advance over the total of 177,979,818 pounds for 1927. These figures of the Rubber Association are estimated to represent 75 per cent of the industry in the United States.

The fact that the warnings of the Federal Reserve Board against stock market speculation have had no effect on the trading in cotton seemed to cause a rapid change of opinion in the trade with regard to the probable tendency of prices in this commodity. There has been a steady advance that has carried the spot price quotation for middling upland cotton in New York from 19.85 cents to 20.35 cents during the past fortnight.

The most important feature of the goods production and sales statement of the Cotton Textile Institute was its showing that the unfilled orders on the books of reporting mills at the end of January this year aggregated 440,585,000 yards, as compared with a total of 313,893,000 yards of unfilled orders at the end of January, 1828.

	High	Low	Close	Close
		Feb. 19		Feb. 4
February	——	——	19.96	19.46
March	20.02	19.95	19.99	19.61
May	20.09	20.04	20.05	19.66

Tire Fabrics

Interest has been shown in lots of carded peeler cords 23s 5-3 ply running to 50,000 pounds in some of the recent trading days. Coverage was light, and Egyptians evoked only passing interest. Late prices follow:

CORD			
Peeler, carded, 23/5/3	lb.	.47 @	.48
Peeler, carded, 22/4/3	lb.	.48 @	.49
Peeler, carded, 12/3/3	lb.	.44 @	.45
Peeler, carded, 15/3/3	lb.	.44½@	.45½
Egyptian, carded, 23/5/3	lb.	.53 @	.54
Egyptian, combed, 23/5/3	lb.	.58 @	.59
CHAFERS			
Carded, American, 8 oz.	lb.	.40 @	.41
Carded, American, 10 oz.	lb.	.41 @	.42
Carded, American, 12 oz.	lb.	.41½@	.42½
Carded, American, 14 oz.	lb.	.40 @	.45
LENO BREAKER			
Carded American, 8¼ oz.	lb.	.40 @	.45
Carded American, 10¼ oz.	lb.	.40 @	.45
SQUARE WOVEN			
Carded American, 17¼ oz. 23-11 ply	lb.	.47 @	.48
Carded American, 17¼ oz. 10-ply	lb.	.40 @	.41

Sheetings

Prices continued unchanged in the sheetings market, with the exception of fractional declines in one or two grades. Latest quotations were as follows:

40-inch, 2.50-yard	yd.	.12¾@	.12⅞
40-inch, 2.85-yard	yd.	.11⅛@	.11¼
40-inch, 3.15-yard	yd.	@	.11⅞
40-inch, 3.60-yard	yd.	@	.09⅝
40-inch, 3.75-yard	yd.	.08⅛@	.08⅜
40-inch, 4.25-yard	yd.	@	.07⅝

Ducks

Sales of hose and belting ducks for March delivery at 38 cents a pound were reported in the closing days of the past fortnight. Enameling ducks sold at 36 cents a pound with higher values on the better grades, and other types were only moderately busy. Late price quotations were as follows:

Beltin gand Hose	lb.	@	.38
Enameling	lb.	.36 @	.38
Single filling	lb.	.14¾@	.16½
Double filling	lb.	.17½@	.18⅛

RECLAIMED RUBBER

Absorption of reclaimed rubber during January was high in sympathy with the record breaking consumption of crude by American factories. New reclaimed plants as well as old factories are running near capacity to keep up the strides being made by the rubber industry, and present indications point to the establishment of new records for the use of both reclaimed and crude during the current year. Orders have been maintained at a high level, and there is little expectation of any slackening until the spring season is well past. Latest prices were as follows:

High Tensile			
Super-Reclaim No. 1 Black	lb.	.13 @	.13½
Super-Reclaim No. 2 Black	lb.	.12 @	.12½
High Tensile Red	lb.	.13 @	.13½
Shoe			
Unwashed	lb.	.07¼@	.07½
Washed	lb.	.10 @	.10¼
Tube			
No. 1 (Floating)	lb.	.14 @	.14½
No. 2 (compounded)	lb.	.11 @	.11½
Tires			
Black, washed		.09¾@	.10¼
Black, unwashed		.08 @	.08½
Black, selected tires	lb.	.08½@	.09
Dark Gray	lb.	.10 @	.10½
Light Gray	lb.	.12 @	.12½
White	lb.	.13 @	.13½
Truck, Heavy Gravity	lb.	.07 @	.07¼
Truck, Light Gravity	lb.	.07½@	.07¾
Miscellaneous			
Mechanical Blends	lb.	.07 @	.07½
Red	lb.	.12½@	.13

Scrap Rubber

No marked change in prices has been recorded in the scrap rubber market during the past two weeks, despite the advance in crude rubber quotations. Activity has remained practically the same, although demand from reclaiming factories is reported to be increasing in some quarters. Accumulations are moderate and about the same as for this time in previous years. Late prices follow:

(Prices to Consumer)

Auto tire peelings	ton	39.00	@42.50
Standard White auto	ton	47.50	@50.00
Mixed auto	ton	24.50	@25.00
Bicycle tires	ton	20.00	@22.50
Clean solid truck tires	ton	22.00	@24.00
Boots and shoes	cwt.	1.40 @	1.55
Arctics, untrimmed	lb.	.00¾@	.00⅞
Inner tubes, No. 1	lb.	.06½@	.06⅝
Inner tubes, No. 2, compounded	cwt.	4.25 @	4.30
Inner Tubes, Red	lb.	.05¼@	.05⅜
Air Brake Hose	ton	34.00	@35.00
Rubber Hose	ton	17.50	@20.00

CRUDE RUBBER

CONTINUATION of the ardor among the bullish element sent spot price quotations for crude rubber well over the 25-cent mark for the first time since the opening days of April, 1928. Reports that manufacturers have been acquiring large stocks in the actual market was a factor in boosting the quotations to higher levels.

In the closing days business in actual rubber in the New York outside market was light, and very little shipment business was put through due to the fact that first hands were offering sparingly and at relatively high prices. Larger factors are operating cautiously in the futures market and are working on both sides, but are reported to be buyers on balance.

The market continues to be a nervous and sensitive one, responding quickly to any developments likely to affect either side. The impression that there is a steady undertone is gained by the action of the market in rebounding rapidly from any minor declines. Trade leaders are said to be looking for a continued nervous market with rapid price fluctuations, and while the market will have reactions from time to time, the trend of values appears to be upward for the immediate future.

Prices on the New York outside market on February 19 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Feb.		.25¼@	.25⅜
March		.25⅛@	.25⅜
Apr.-June		.25½@	.25¾
July-Sept.		.25¾@	.26
First Latex, crepe spot		.25⅝@	.25⅞
Amber Crepe, No. 2		.23½@	.23¾
Amber Crepe, No. 3		.23¼@	.23½
Amber Crepe, No. 4		.23 @	.23¼
Brown Crepe, Clean, thin		.23¼@	.23½
Brown Crepe, specky		.23 @	.23¼
Liquid Latex, per gal.		1.00	
Paras—			
Up-river Fine		.25¾@	.26
Up-river Medium		Nominal	
Up-river Coarse		.15¾@	.16
Acre Bolivian, fine		.26¼@	.26½
Caucho Ball, Upper		.15¾@	.16
Islands, fine		Nominal	
Centrals—			
Central, scrap		.15 @	.15½
Esmeraldas		.15 @	.15½
Balata—			
Block, Colombia		Nominal	
Block, Cuidad		.50 @	—

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

Spot-Feb.	@	.12½d
Mar.-June	.12½@	.12¾d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers

Spot	@	12¼d

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LATE RUBBER CHEMICAL PRICES

Accelerators—Colors—Softeners—Compounding Materials

NEW YORK, FEBRUARY 19, 1929

RECORD breaking consumption of crude rubber in the United States during January was accompanied as a matter of course by the use of more rubber chemicals and compounding ingredients than in any previous month in the industry's history. As a result, stocks have been somewhat reduced and suppliers of these materials are increasing their volume of production. Such a heavy demand was not expected so early in the year, but manufacturers of chemical ingredients have proved equal to meeting the needs of the industry. Further preparations are being made to handle the greater demand that is looked for in the near future, and within the past few weeks there have been announcements of expansions in more than one large chemical factory.

Prices have remained stable during the past fortnight, only slight variations in some of the minor chemicals being recorded. The recent slight rise among carbon blacks is still holding, and there is little reason to expect any wide fluctuation in the near future.

ACCELERATORS

Organic			
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
Aero-X	lb.	.75 @	—
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16¼
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolylguanidine	lb.	.42 @	.52
Diphenylguanidine	lb.	.30 @	.36
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde Aniline	lb.	34 @	.44
Grasselerator 102	lb.	.62½@	.63½
Grasselerator 552	lb.	— @	4.45
Grasselerator 808	lb.	.80 @	.85
Grasselerator 833	lb.	1.17 @	1.30
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.62½@	.65
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.35 @	.45
Monex	lb.	3.25 @	—
Oynone	lb.	.68 @	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92 @	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45 @	4.60
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
Safex	lb.	1.20 @	1.25
Tensilac, No. 39	lb.	.50 @	.52½
Tensilac, No. 41	lb.	.50 @	.52½
Thermic F	lb.	.50 @	.55
Thiocarbanilide, drums	lb.	.26½@	.28½
Thionex	lb.		
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.62½
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Waxene	lb.	.30 @	.32
Z 88	lb.	.65 @	.69
Inorganic			
Lead, sublimed blue	lb.	.07¾@	—
Lead, white	lb.	.10½@	.12½
Litharge, domestic	lb.	.09 @	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.32 @	.35
Ultramarine	lb.	.06 @	.30
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.27 @	.31
medium	lb.	.29 @	.32
dark	lb.	.31 @	.34
Chromium Oxide, bbl.	lb.	.34 @	.36
Reds			
Antimony			
crimson, 15/17	lb.	.44 @	.50
sulphur free	lb.	.50 @	.55
golden 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.12
Domestic (Maroon)	lb.	.08 @	.12
Oximony	lb.	.18¼@	—
Red oxide, pure	lb.	.10 @	.12
Venetian red	lb.	.03 @	.06
Vermillion, quicksilver, English	lb.	1.85 @	1.95
Whites			
Lithopone, Akcolith	lb.	.05 3/5@	.06
Lithopone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox	lb.	.09½@	.10
Cal. Base Pigment	lb.	.10 @	.10½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Zinc Oxide—French Process			
White seal	lb.	.11⅞@	—
Green seal	lb.	.10⅞@	—
Red Seal		.09⅞@	—
Yellows			
Chrome	lb.	.15½@	.16½
Ocher, French medium	lb.	.03½@	.06
domestic	lb.	.01⅝@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate	lb.	.10½@	.12
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	12.00 @	13.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Blacks			
Arrow "Aerfloted"	lb.	.03½@	.12½
Bone Black	lb.	.05½@	.11
Carbon, compressed	lb.	.03½@	.12½
Carbon, uncompressed	lb.	.08 @	.12
Drop Black	lb.	.06 @	.10
Fumonex	lb.	.06 @	.09
Gastex	lb.	.05¼@	.05½
Lamp Black	lb.	.12 @	.40
Micronex	lb.	.09 @	.13
Velvetex carbon	lb.	.04½@	.06
Blanc fixe dry f.o.b. works	lb.	.03½@	.03⅝
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk	ton	12.00 @	14.00
Clay, China, domestic	ton	8.00 @	9.00
Aerfloted Suprex	ton	10.00 @	22.00
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Mineral Flour, c. l. fob mine	ton	20.00 @	23.00
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, powdered	ton	65.00 @	80.00
Rotten Stone (powdered)	lb.	.02½@	.04½
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.30 @	3.70
Talc, domestic	ton	12.00 @	15.00
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	—
Superfine	ton	10.00 @	12.00
Witco	ton	12.00 @	—
Wood pulp XXX	ton	45.00 @	—
Wood pulp X	ton	25.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.24 @	.25

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Montezuma, solid	ton	28.00 @	36.00
Montezuma, granulated	ton	32.00 @	42.00
Paradura	ton	62.50 @	65.00
Pioneer, MR, solid	ton	42.00 @	45.00
Pioneer-granulated	ton	52.00 @	55.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulphuric, 60 degrees	ton	10.50 @	11.50
66 degrees	ton	15.00 @	16.00
Tartaric, crystals	lb.	.37 @	.38
Acids, Fatty			
Stearex	lb.	.15 @	.20
Stearic, double pressed	lb.	.18 @	.22
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	
Oils			
Corn, refined, bbls.	lb.	.11 @	.11½
Cottonseed, crude		.08½@	.08¾
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c. l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05 @	.06
Hexalin	lb.	.60 @	—
Acetate	lb.	.70 @	—
Linseed, Raw C.L. bbl.	lb.	.09½@	.10
Palm Lagos	lb.	.07¼@	.07½
Niger	lb.	.07¾@	.08
Vansulol	lb.	.10½@	—
Para-Flux	gal.	.17 @	—
Peanut, domestic, crude	lb.	.12 @	.12¼
Petrolatum, white	lb.	.08 @	.08½
dark amber	lb.	.03¾@	.03¾
Pine, steam distilled	gal.	.65 @	.70
Rapeseed, refined	gal.	1.04 @	1.06
second rectified	gal.	.58 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	9.00 @	10.00
Rosin, grade K, 280 lb. bbl.		8.55 @	—
Pigmentar	gal.	.33 @	.41
Solvenol, drums	gal.	.45 @	.50
Tarol, drums	gal.	.30 @	.35
Tar Retort, 50 gal.	bbl.	12.50 @	13.00
Solvents			
Acetone, pure	lb.	.13 @	
Alcohol denatured, No. 1 bbls.	gal.	.37½@	.44½
Benzol, 90%	gal.	.28 @	—
Carbon bisulphide	lb.	.05½@	.06¼
Carbon tetrachloride	lb.	.06¼@	.07
Motor gasoline, steel bbls.	gal.	.17 @	—
Naptha, solvent	gal.	.35 @	.40
Turpentine, spirits	gal.	.60 @	.64
wood	gal.	.50 @	.54
Waxes			
Beeswax	lb.	.56 @	.58
Carnauba	lb.	.33 @	—
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.07 @	.07½
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Miscellaneous			
RSL Mold Solution	gal.	.75 @	.100

ANTI-OXIDANTS

Albasan	lb.	.70 @	.75
Antox	lb.	.79 @	.83
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.55 @	—
VGB	lb.	.55 @	.66

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulphur Chloride (drums)	lb.	.03¼@	.03½
Sulphur flour, Refined, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

CONSUMPTION of crude rubber in the United States surprised those who had figured January as a fairly slack month. Instead of a comparatively low absorption, the figures for last month showed that all previous records had been broken with 43,002 long tons of rubber used in American factories. This offset to some extent the high imports brought into the country and is a fair indication that 1929 is to be a new banner year for the industry.

The amount of rubber invoiced to the United States finally began to decline during the week of February 16, when only 7,575 tons were shipped to this country. For fifteen weeks previous there had been no figure recorded below 11,000 tons. The decline was most marked in the shipments from British Malaya, which furnished only 3,771 tons as compared with an average of about 10,000 tons weekly during the past three months.

Final figures for 1928 production showed that estimates of an output of 78,000,000 tires and 80,000,000 tubes had been more than fulfilled. The use of reclaimed rubber rose above 200,000 tons for the first time in the history of the industry, and other record levels were attained in other branches of rubber manufacturing. Imports during 1928 broke all previous marks, and preliminary reports of January arrivals indicate that 1929 will see even higher figures.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	489,731	244,854,978	25.03	32,159	18,128,361	25.17	407,572
1926:							
July	35,820	33,061,281	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1,318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.25	1,437	1,519,870	47.20	35,675
Oct.	29,746	25,320,558	38.49	1,366	1,316,270	43.03	28,110
Nov.	39,155	34,890,536	39.78	1,482	1,411,517	42.51	37,673
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	43.16	35,850
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,671
Nov.	38,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,895	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.*	49,719	19,906,074	17.87				
Feb.							
Mar.							
Apr.							
May							
June							

*Arrivals at New York and Boston.

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	16,938	30,106	29,058	29,638	32,196	31,518	34,403	43,002
Feb.	14,767	30,149	25,736	19,761	31,136	30,137	33,702	
Mar.	21,408	36,629	28,385	33,498	32,936	36,141	35,688	
Apr.	19,294	29,085	27,129	34,139	32,696	35,871	32,772	
May	23,246	36,155	25,845	35,322	29,364	34,592	37,333	
June	31,713	24,272	22,758	35,822	28,598	33,801	37,676	
July	24,522	17,685	23,396	36,053	27,577	29,219	37,407	
Aug.	29,631	20,359	28,982	35,909	34,533	33,460	42,927	
Sept.	24,410	17,594	31,497	31,691	32,904	27,214	39,882	
Oct.	26,881	21,321	31,520	29,047	29,836	26,790	40,857	
Nov.	24,950	20,437	27,289	28,853	28,080	26,792	37,461	
Dec.	25,070	31,902	27,199	28,748	26,293	25,492	31,232	
Totals	282,560	305,694	328,769	388,481	366,149	371,027	441,340	

Figures on Quarterly Basis

Quarter	1921	1922	1923	1924	1925	1926	1927	1928
Jan./Mar.			96,776	87,609	95,263	94,301	99,216	103,558
Apr./June	65,463	127,360	89,493	75,674	104,099	87,109	103,242	103,500
July/Sept.			55,621	83,813	99,493	93,793	89,210	117,573
Oct./Dec.	105,962	155,067	63,617	92,656	85,789	88,212	80,860	
Totals	171,425	282,427	305,507	339,752	384,644	358,415	372,528	324,631

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
Nov. 24	13,920	935	1,911	363	17,129
Dec. 1	10,731	1,265	2,624	963	15,583
Dec. 8	10,061	1,443	1,694	17	13,215
Dec. 15	9,785	1,661	2,215	330	13,991
Dec. 22	10,697	1,766	1,642	96	14,201
Dec. 29	8,613	577	2,197	8	11,395
Jan. 5	10,035	1,479	1,608	15	13,137
Jan. 12	9,075	1,628	1,807	299	12,809
Jan. 19	9,469	1,231	2,152	211	13,063
Jan. 26	7,163	1,650	2,271	47	11,131
Feb. 2	9,216	1,784	2,612	23	13,635
Feb. 9	8,341	1,066	1,773	65	11,245
Feb. 16	3,771	1,648	1,982	174	7,575

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1926																																
July	42	42	42	—	—	41½	41½	41½	41½	42½	—	41½	41	40	40	40	—	40	40	41½	41½	41	41½	41½	—	41½	41½	41	41	39	39	41¼
August	—	38½	38½	—	37	38¼	39	—	38¾	37½	37½	37½	38½	38½	—	39	39	39	39	39	39½	41½	39	39	39	39	39	39½	39½	40	38½
September	40¼	40¼	40¾	37	—	40¼	40¼	—	40¼	40¾	40¾	40½	40½	40½	40¼	40¼	40½	40½	40½	40½	41½	41¾	42¾	42	42¾	42½	42¾	42½	42½	42½	41	41
October	43	43	43	43½	42¾	42½	42½	—	42¾	42¾	42¾	42½	42½	43	43	43¼	42½	42½	42½	42¾	42¾	42½	42½	42½	42½	42½	42½	42½	42½	—	—	42½
November	41¼	—	41	41¼	41½	41½	—	41¾	41¾	41¾	41½	41¾	41¾	41¾	41¾	40¾	40½	39½	39½	39	38	38½	38	38	—	38	38	37	37	—	—	38½
December	36½	37½	37½	37½	—	37	—	37¾	37	37	37½	—	37½	37¾	37¾	38	38	38	—	38	38¾	38½	38¾	38½	39	39	39	39	38½	38¾	38¾	38¾
1927																																
January	—	39	39	39	39¾	40½	40¾	40¾	40½	40½	40½	40¾	40	39¾	39¾	39¾	39½	38¾	38½	38½	38¾	38¾	38¾	38½	38¾	38¾	38¾	38¾	38¾	38	—	38¾
February	—	37¾	37½	37½	37½	—	—	37¾	37¾	37¾	37¾	37¾	37¾	38	38	38	38	38	38	38	38	38	38	39	39	39	39	39	39	—	—	38¾
March	39	39¾	40	40¾	41	41	40¾	40¾	40¾	41	41¼	41	41	41¼	41¼	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41¼	41¼	41
April	41¼	41¾	41¾	41	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41	41	40¾	40¾	40¾	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½
May	—	40¼	40¼	40½	41	41	40¾	40¾	41¼	41¼	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	41	41	40½	40¾	40¾	40¾	40¾	40¾	40¾
June	40¾	40¾	40¾	40¾	40¾	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½	39½
July	40½	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾
August	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½
Sept.	34	34	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	34	34	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼
Oct.	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	36¼	36½	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
Nov.	40	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Dec.	40½	40¼	40¼	40¼	40¼	—	—	40½	40¼	40¼	40¼	40¼	40¼	40	39¾	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼
1928																																
January	—	—	41¼	41¼	41¼	41¼	41	41	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼
February	37½	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾
March	29	28¾	28¾	28¾	29	28¾	—	26¾	25½	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾
April	27¼	27½	27½	21¾	21¼	—	18%	19¼	—	20	18%	18%	18½	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19
May	17½	17%	18%	19¼	19¼	—	19¼	19%	18%	18%	18%	18%	18%	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19%	19
June	19¼	19%	19%	19%	19%	19%	19%	19%	—	19%	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	19½	20	20¼	20¼	20	19	19¼	19%	19½
July	—	18%	18%	18%	—	19	19	19	19	19	19½	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
August	19½	19½	19%	19%	19%	19%	19%	19%	20	20	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
September	—	18%	18½	18%	18%	18%	18%	18%	—	18%	18%	18%	18%	18%	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
October	18%	18½	18½	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
November	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
December	17%	—	17%	17%	17%	17%	18%	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
1929																																
January	—	18½	18½	18½	18½	18½	—	18½	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
February	22%	22	—	21%	22¼	22¼	22¼	22%	22%	22%	22%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	——
Mar.	14.53	34.21	22.85	41.00	59.00	41.04	26.82	——
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	——
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	——
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	——
July	14.67	26.10	22.16	103.16	41.03	23.44	19.40	——
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	——
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	——
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	——
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	——
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	——
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	——

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Nov.	Dec.	Jan.	Feb.	Day	Nov.	Dec.	Jan.	Feb.
1	8⅞	8½	—	11⅛	17	8⅝	8½	10¼	—
2	8⅞	—	8⅝	11	18	—	8⅝	10⅛	12½
3	8⅞	8½	8⅝	—	19	8½	8⅝	10⅛	12½
4	—	8½	8⅝	10¾	20	8⅝	8⅝	—	—
5	8⅞	8½	8⅞	11	21	8⅝	8⅝	10⅛	—
6	8⅞	8½	—	10⅞	22	8⅝	8⅝	10¼	—
7	8⅞	8⅝	8¾	10⅞	23	8⅝	—	10⅜	—
8	8⅞	8½	8⅞	10⅞	24	8⅝	8⅝	11	—
9	8⅝	—	9⅛	11	25	—	—	10⅞	—
10	8¾	8½	9⅛	—	26	8⅝	8⅝	11	—
11	—	8½	9¾	11⅛	27	8⅝	8⅝	—	—
12	8½	8½	10⅜	11	28	8½	8¾	11⅛	—
13	8¼	8½	—	11¼	29	8½	8⅝	10⅝	—
14	8¼	8½	10¼	11⅜	30	8½	—	10⅝	—
15	8¼	8½	10	11⅞	31	—	8⅝	11	—
16	8⅛	—	10⅛	12⅝					

Average Monthly Price Per Pound

Month	1927 Pence	1928 Pence	1929 Pence	Month	1927 Pence	1928 Pence	1929 Pence
Jan.	19.410	19.310	9.942	Aug.	17.202	9.300	——
Feb.	19.021	15.713	——	Sept.	16.293	8.530	——
Mar.	20.125	12.736	——	Oct.	16.366	8.807	——
Apr.	19.897	8.864	——	Nov.	18.159	8.596	——
May	19.769	8.845	——	Dec.	19.690	8.570	——
June	17.880	9.293	——	Average for Year	18.375	10.656	——
July	16.770	9.312	——				

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Jan.	Feb.	Day of Month	Jan.	Feb.	Day of Month	Jan.	Feb.
1	——	20.05	11	20.25	20.20	21	20.40	——
2	20.10	20.05	12	20.35	——	22	20.40	——
3	20.25	——	13	——	20.30	23	20.40	——
4	20.00	19.85	14	20.55	20.20	24	20.30	——
5	20.00	19.85	15	20.25	20.15	25	20.10	——
6	——	19.95	16	20.55	20.25	26	20.10	——
7	19.95	20.00	17	20.35	——	27	——	——
8	20.00	20.05	18	20.40	20.35	28	20.15	——
9	20.25	20.00	19	20.40	20.25	29	20.05	——
10	20.20	——	20	——	——	30	19.95	——
						31	20.00	——

Average Monthly Price Per Pound

Month	1927 Cents	1928 Cents	1929 Cents	Month	1927 Cents	1928 Cents	1929 Cents
Jan.	13.42	19.12	20.22	Aug.	20.04	19.28	——
Feb.	14.10	18.40	——	Sept.	21.95	18.67	——
Mar.	14.32	19.38	——	Oct.	20.22	19.62	——
Apr.	14.75	20.63	——	Nov.	20.22	19.84	——
May	16.07	21.58	——	Dec.	19.58	20.22	——
June	16.85	21.50	——	Average for Year	17.49	19.97	——
July	18.00	21.36	——				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	76,172	110,244	76,342	45,312	41,256	78,596	121,484	151,500	154,938
Feb.	91,186	108,955		42,166	43,316		133,352	152,271	
March	85,740	114,061		49,600	39,324		135,340	153,385	
April	92,757	113,083		38,963	33,986		131,720	147,069	
May	94,563	105,356		44,181	34,374		138,744	139,730	
June	89,250	90,198		47,233	40,001		136,483	130,119	
July	98,469	83,242		40,687	42,304		139,056	125,546	
Aug.	96,148	68,994		40,937	51,875		137,085	120,869	
Sept.	97,829	68,851		37,966	48,566		135,793	117,417	
Oct.	97,452	66,421		42,804	41,571		140,256	107,992	
Nov.	101,034	61,956		37,076	68,119		138,110	130,075	
Dec.	100,130	66,166		47,938	68,764		148,068	134,930	

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1920	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	19,300	56,573	67,252	73,498	57,460	27,172	9,994	54,994	66,524
Feb.	18,329	59,439	67,623	70,483	56,732	23,425	10,004	58,826	62,964
Mar.	18,969	63,913	66,670	63,438	55,647	18,104	13,127	63,055	58,272
Apr.	20,072	68,759	68,637	58,770	54,559	12,949	18,773	66,897	53,425
May	20,921	70,403	70,146	54,439	51,615	5,895	20,384	67,169	44,628
June	22,517	69,408	71,597	51,050	51,115	5,318	23,984	63,902	38,756
July	25,346	71,065	71,515	49,937	52,073	4,258	27,727	63,717	35,429
Aug.	30,674	73,211	72,112	58,427	49,700	4,619	30,165	64,491	32,084
Sept.	35,504	72,175	70,977	54,523	44,011	5,453	35,077	68,236	31,440
Oct.	41,743	69,229	68,536	58,891	37,523	5,086	42,138	69,569	24,207
Nov.	45,550	70,786	68,548	60,074	33,593	3,869	44,057	67,050	17,775
Dec.	50,652	69,792	72,299	60,246	29,488	5,697	48,918	63,793	19,815

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1928					
January	64,360	65,524	65,450	66,285	———
February	65,909	64,945	63,769	63,103	———
March	61,978	61,920	61,033	59,644	58,197
April	58,732	58,945	56,819	53,360	———
May	52,015	50,837	48,705	44,628	———
June	43,716	42,683	41,185	40,083	38,611
July	36,915	35,925	35,238	35,445	———
August	34,294	33,649	32,591	32,815	———
September	31,933	31,477	32,110	31,884	31,462
October	29,525	27,370	26,477	24,240	———
November	22,919	21,494	20,194	18,724	———
December	16,855	16,517	17,669	18,821	19,727
1929					
January	21,953	23,016	23,547	24,423	———
February	25,389	25,413	24,757		———

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1926	1927	1928	End of	1926	1927	1928
Jan.	16,726	25,440	25,868	July	23,101	22,558	18,663
Feb.	13,653	26,766	22,867	Aug.	23,362	25,764	18,971
Mar.	18,389	27,844	20,538	Sept.	25,997	25,178	14,898
Apr.	16,328	24,543	16,946	Oct.	26,614	25,790	12,149
May	16,967	25,133	17,437	Nov.	25,486	28,369	29,188
June	19,416	21,898	18,207	Dec.	26,443	25,798	32,895

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1925	26,001,664	66.8	1928	24,247,282	81.6
1928			1929		
July	2,209,692	85.9	January	1,835,207	79.4
August	2,318,898	80.2	February		
September	2,315,604	76.9	March		
October	2,114,611	72.2	April		
November	1,213,245	66.4	May		
December	1,101,193	74.7	June		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1925	1926	1927	1928	1929
January	14,386,000	17,582,000	17,888,000	20,938,000	
February	13,210,000	15,814,000	18,240,000	21,136,000	
March	14,890,000	19,302,000	22,464,000	24,041,000	
April	19,013,000	20,848,000	23,371,000	25,712,000	
May	20,459,000	24,213,000	26,579,000	27,355,000	
June	20,724,000	23,803,000	27,799,000	29,022,000	
July	22,879,000	24,752,000	29,784,000	30,960,000	
August	22,323,000	26,912,000	29,779,000	33,148,000	
September	20,177,000	22,929,000	28,409,000	29,691,000	
October	19,826,000	23,973,000	25,497,000	30,610,000	
November	18,024,000	20,618,000	24,400,000	26,222,000	
December	17,954,000	21,419,000	23,718,000	26,644,000	
TOTAL	223,865,000	262,165,000	297,928,000	327,932,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	4,587	4,965	5,491	2,974	4,932	5,394	9,947	10,432	9,949
Feb.	4,865	5,095	6,363	3,436	4,458	5,031	11,164	11,075	11,721
Mar.	5,456	6,276	6,819	4,561	5,701	5,731	12,004	11,583	12,389
Apr.	5,846	6,299	6,178	4,980	5,701	5,812	12,461	12,122	12,717
May	5,023	6,151	6,759	5,211	5,657	6,457	12,343	12,462	13,024
June	5,422	6,202	6,692	5,724	6,253	7,117	11,968	12,462	12,162
July	4,950	5,087	6,498	6,337	5,973	7,895	10,592	11,326	11,157
Aug.	5,872	5,752	7,469	6,744	6,393	8,403	9,732	10,721	10,034
Sept.	5,706	4,822	6,802	6,040	5,717	7,145	9,318	9,722	9,765
Oct.	5,103	4,773	7,326	4,544	4,799	5,717	9,917	9,665	11,520
Nov.	4,324	4,502	6,075	3,733	4,306	4,998	10,297	10,136	12,579
Dec.	4,683	4,497	5,605	4,718	4,165	4,591	10,456	10,264	13,624

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	6,809	5,337	5,441	3,723	6,016	6,072	14,361	15,585	12,982
Feb.	6,825	5,658	6,895	3,736	5,120	5,431	17,090	16,075	14,650
Mar.	7,030	7,184	6,231	4,987	6,157	5,731	19,131	17,096	15,573
Apr.	6,554	7,373	6,661	5,051	6,359	5,702	20,674	17,801	16,638
May	6,149	6,737	7,168	6,304	6,140	6,300	21,141	18,389	17,702
June	6,171	6,306	6,953	6,898	6,832	7,136	20,243	17,858	17,159
July	5,729	5,284	6,674	8,569	7,070	8,729	17,267	16,004	14,974
Aug.	7,424	6,480	8,343	9,579	7,983	9,350	15,462	14,664	13,931
Sept.	7,590	5,651	7,103	7,762	6,758	7,154	15,312	13,511	13,543
Oct.	6,208	5,065	6,929	5,474	5,024	5,662	15,929	13,539	15,285
Nov.	4,852	4,775	5,592	4,045	4,723	5,002	16,604	13,585	15,743
Dec.	5,277	4,969	5,184	5,463	4,712	4,858	16,200	13,692	16,117

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927							
Jan.	238,926	199,650	39,276	15,376	11,745	3,631	254,302
Feb.	304,758	264,171	40,587	18,655	14,826	3,829	323,413
March	394,430	345,911	48,519	23,250	19,723	3,527	417,680
April	404,743	357,009	47,734	24,611	20,890	3,721	429,354
May	404,099	357,148	46,951	25,708	21,991	3,717	429,807
June	321,959	278,728	43,231	19,208	16,470	2,738	341,167
July	268,474	236,866	31,608	10,987	8,719	2,268	279,461
Aug.	308,807	274,378	34,429	12,526	10,139	2,387	321,333
Sept.	260,420	226,440	33,980	11,262	8,681	2,581	271,682
Oct.	219,712	183,041	36,671	7,791	6,236	1,555	227,503
Nov.	134,381	109,742	24,639	6,617	5,173	1,444	140,998
Dec.	133,178	105,784	27,394	3,435	2,277	1,158	136,613
TOTAL	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	233,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	337,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,536	13,016	5,520	415,632
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	233,135	205,144	27,991	9,425	6,734	2,691	242,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]								DUTCH EAST INDIES[3]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[2]	Sarawak[4]	British North Borneo[4]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[2]	Amazon Valley	All Other[4]	World Total[7]
1923	252,016	70,432	181,584	29,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,866
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,528
1926	391,328	151,248	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,332	149,777	259,555	57,546	10,790	10,087	6,505	4,813	58,848	82,537	120,919	9,744	21,129	10,675*	653,148*
1927:															
Jan.	34,946	14,995	19,951	6,697	921	959	585	304	4,187	6,706	10,690	941	3,482	981	56,404
Feb.	27,528	11,697	15,831	3,571	1,469	552	445	360	4,078	6,526	10,535	675	2,104	1,098	47,244
Mar.	41,346	17,464	23,882	7,142	1,124	997	639	432	5,657	7,004	12,905	733	3,178	1,791	65,484
Apr.	29,041	13,069	15,972	3,349	723	984	452	526	4,666	5,531	10,197	557	2,451	1,520	46,928
May	31,393	15,491	15,902	3,124	760	786	415	348	5,430	5,529	13,410	586	2,460	1,207	49,957
June	32,607	14,706	17,901	3,345	856	1,100	539	409	4,818	5,518	9,109	772	889	1,731	46,990
July	23,947	12,697	11,250	4,018	827	859	544	333	4,771	6,142	11,566	519	1,757	1,113	43,699
Aug.	30,371	17,105	13,266	5,357	688	1,133	623	546	4,355	6,682	12,440	716	1,928	969	48,703
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	802	721	591	542	3,810	7,755	13,633	775	2,752	939	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	600	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,763	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,789	16,618	11,171	3,830	1,605	842	581	525	4,851	7,988	11,360	1,100	2,273	1,025	47,151
Feb.	28,848	12,911	15,937	4,947	1,081	667	581	536	4,052	6,757	8,635	787	1,612	1,276	46,868
Mar.	27,879	10,508	17,371	3,683	775	645	581	269	3,999	5,826	9,690	700	2,750	1,211	47,500
Apr.	20,139	9,335	10,804	3,233	789	630	494	258	3,993	5,040	5,538	736	1,014	1,328	33,852
May	26,483	10,350	16,133	3,091	654	842	494	241	4,943	5,855	10,382	717	2,602	1,135	46,049
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,623	725	1,399	960	40,756
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,424	698	1,264	873	52,561
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,798	712	1,732	450	56,840
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,791	1,112	1,614	494	50,144
Oct.	24,441	12,603	11,838	3,999	864	949	500*	457	5,295	7,474	9,977	566	1,399	732	44,050*
Nov.	68,072	10,436	57,636	8,005	1,048	772	500*	425	4,950	7,902	7,805	943	1,790	623	92,399*
Dec.	66,763	11,112	55,651	8,127	1,113	744	500*	294	5,120	8,792	10,896	948	2,220	588	94,993*
1929:															
Jan.	52,546	13,415	39,131	8,190								895	2,134		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, and 2,439 in 1927. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 13 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, and about ½ ton in 1927. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I" are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, and 84 tons in 1927. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States*	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Austra-lia (ed)	Belgium (d)	Nether-lands	Scandi-navia (abcdf)	Spain (g)	Czecho-slovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,585
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,523	630	1,128	408,619
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,846	3,124	2,685	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,498
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,643
1927	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,492	636	4,224	2,055	2,672	627,789
1928	404,488	4,846		37,855	30,891		12,433		8,430		2,443				
1927:															
January	41,815	10,192	3,284	2,481	1,936	1,227	672	803	929	296	192	316	139	100	64,382
February	25,886	7,692	3,268	3,108	2,620	1,902	601	907	460	502	152	336	146	210	47,780
March	32,752	9,049	2,050	3,475	3,760	1,578	852	784	780	454	86	385	137	127	56,269
April	44,627	7,875	2,310	2,393	1,509	2,181	781	1,972	762	448	58	230	177	218	65,541
May	33,736	2,896	2,006	3,380	2,519	1,084	918	887	694	626	-57	335	155	223	49,402
June	31,270	2,282	2,387	3,632	2,086	798	942	1,506	557	583	-17	243	164	183	46,616
July	35,719	1,116	2,384	2,899	2,104	1,505	1,007	415	900	429	66	227	177	236	49,184
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	138	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,458	1,242	784	-202	514	268	300	47,028
1928:															
Jan.	37,119	1,921	1,764	2,485	2,290	1,361	760	755	802	589	52	261	335	376	50,870
Feb.	30,925	3,143	2,526	2,984	2,553	1,248	437	783	616	599	98	307	296	297	46,812
Mar.	36,898	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,254
April	35,663	—2,280	2,204	2,719	1,938	2,334	1,115	1,820	832	575	280	339	304	159	48,001
May	28,660	—5,823	3,210	2,944	2,180	2,288	1,095	3,893	655	746	209	485	220	213	41,469
June	25,144	—3,031	4,550	2,968	2,632	2,102	984	4,111	348	743	133	346	251	182	41,463
July	28,171	—1,374	2,652	3,387	2,692	2,026	1,599	724	591	895	395	294	175	384	42,609
Aug.	28,827	48	3,587	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,081
Sept.	36,797	4,199	3,524	3,553	2,810	1,837	1,278	20	603	597	345	377	277	235	56,452
Oct.	41,667	—934	3,728	4,386	2,943	3,711									
Nov.	33,836	—3,141	3,278	3,694	2,799	3,711	1,049		776	696	141	527	250	318	
Dec.	40,781	8,438		2,470	2,618	2,150	1,340		837	544	31		252	282	
1929:															
Jan.							1,145		755		148				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926; to 5,019 tons in 1927; and to 3,076 in the first eleven months of 1928.

BOOK REVIEWS

ANNUAL REPORT OF THE SECRETARY OF AGRICULTURE. By W. M. Jardine. Published by the Government Printing Office, Washington, D. C. 1928. 124 pp.

In his regular report, Secretary Jardine devotes considerable space to the department's investigation of rubber production possibilities in the United States. He declares definitely that it has been found that tropical rubber trees will grow to normal maturity and produce seeds in Florida, and states that, while the cultivation of guayule is being increased to the scale of commercial production in California, the department is studying other rubber plants in that State. His report also contains much of interest to rubber goods manufacturers in those sections with which he deals with cotton production.

REDUCING THE COST OF ELECTRIC POWER. Published by the Electric Machinery Manufacturing Company, Minneapolis, Minn. December 1928. 48 pp.

The increasing use of penalties for low power factor where power is purchased and the continual efforts to minimize the cost of electric power where it is privately generated, make a subject of considerable interest to every power user. It is the purpose of this large and well-illustrated book to give a non-technical explanation of power factor and to show when and how to apply capacitors to reduce electric power cost.

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,480	760,690	727	937,038	8,332	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,805	2,562,096	354	327,218	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:								
Jan.	432	242,339	27	24,218	588	183,705	150	86,702
Feb.	489	281,295	33	32,165	403	142,621	312	215,085
Mar.	575	365,927	32	26,460	829	388,616	115	57,883
Apr.	512	312,131	47	32,924	592	174,970	68	27,627
May	452	283,414	—	——	679	226,064	100	42,762
June	424	220,081	9	6,799	293	91,152	28	12,374
July	191	100,342	123	46,747	373	113,295	81	27,344
Aug.	—	——	399	165,460	451	126,962	147	60,738
Sept.	—	——	60	38,198	2,028	713,736	125	56,768
Oct.	—	——	121	59,358	429	129,065	239	94,570
Nov.	—	——	59	41,119	472	140,116	88	35,409
Dec.	—	——	83	58,311	522	156,154	145	59,911

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1919	81,866	73,535	36.3	.....
1920	86,395	75,297	38.4	.....
1921	36,725	41,351	24.1	.....
1922	57,834	54,458	19.3	.....
1923	74,766	69,534	22.7	.....
1927:				
Jan.	16,526	12,374	39.3	25,903
Feb.	15,860	14,424	47.8	27,291
Mar.	16,788	13,528	37.4	27,124
Apr.	14,483	16,677	46.5	25,712
May	16,159	15,754	46.1	26,419
June	16,652	15,547	46.0	25,811
1928:				
Jan.	14,862	18,134	52.7	21,941
Feb.	15,291	16,808	49.9	20,848
Mar.	17,069	18,619	52.2	19,558
Apr.	15,393	17,355	52.9	19,283
May	18,945	18,201	48.8	18,137
June	18,781	16,328	43.4	18,709
1929:				
Jan.				
Feb.				
Mar.				
Apr.				
May				
June				

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1924	80,079	76,072	22.4	.....
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	23,218
1927	189,144	178,471	47.6	24,980
1928	208,516	200,200	45.4	24,785
July	15,488	13,842	47.4	26,599
Aug.	15,109	15,836	47.3	25,157
Sept.	14,392	14,790	54.3	23,429
Oct.	16,127	17,292	64.5	22,176
Nov.	15,477	14,876	55.5	21,728
Dec.	16,083	13,431	52.7	24,980
July	17,278	17,173	45.9	17,305
Aug.	19,049	15,532	36.2	15,881
Sept.	18,693	16,022	40.2	17,991
Oct.	17,182	16,587	41.7	17,026
Nov.	18,245	16,547	44.2	22,399
Dec.	17,728	12,894	41.3	24,785
July				
Aug.				
Sept.				
Oct.				
Nov.				
Dec.				

***Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927.**

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